COURSE DESCRIPTION CARD - SYLLABUS

Course name

Building Systems - Heating and Ventilation

Course

Field of study

ARCHITECTURE

Year/Semester

II/4

Area of study (specialization)

-

Profile of study

general academic

Level of study

First-cycle studies

Course offered in

polish/english

Form of study

full-time

Requirements

compulsory

Number of hours

Lecture

0

Laboratory classes

0

Other (e.g. online)

0

Tutorials

15

Projects/seminars

0

Number of credit points

1

Lecturers

Responsible for the course/lecturer:

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Responsible for the course/lecturer:

mgr inż. arch. Aneta Biała

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mgr inż. Jerzy Kosmatka

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Prerequisites

Knowledge:

• the student has a structured, founded general knowledge covering key issues in the field of building physics,

• the student knows the basic methods, techniques and materials used to solve simple engineering tasks in the field of building physics

• the student has a basic knowledge of development trends in the field of energy-saving and passive construction

2 Skills:

the student is able to obtain information from literature, databases and other, properly selected sources, also in English, is able to integrate information, interpret it, as well as draw conclusions and formulate and justify opinions,

the student is able to communicate using various techniques in the professional and other environments

the student is able to use information and communication techniques appropriate to the implementation of tasks typical for engineering activities

3 Social competences:

the student understands the need for lifelong learning, is able to inspire and organize the learning process of other people,

the student is aware of the importance and understands the non-technical aspects and effects of engineering activities, including its impact on the environment and the related responsibility for decisions made,

the student is able to interact and work in a group, assuming various roles in it

Course objective

1. acquiring the latest knowledge in the field of heating, ventilation and air conditioning in residential and industrial buildings,

2. mastering design skills,

3. learning the methodology of calculating the demand for thermal power of rooms and buildings as well as thermal-flow and hydraulic calculations for ventilation, air conditioning.

Course-related learning outcomes

Knowledge

Student knows and understands:

B.W4. mathematics, space geometry, statics, material strength, shaping, construction and dimensioning of structures, to the extent necessary to formulate and solve tasks in the field of architectural and urban design;

B.W5. issues of construction, construction technologies and installations, construction and building physics, covering key issues in architectural, urban and planning design as well as issues related to fire protection of buildings;

B.W6. investment economics and organization methods as well as the course of the design and investment process; basic principles of design and implementation quality management in the construction process;

B.W9. principles of occupational health and safety.

Skills

Student can:

B.U3. use properly selected computer simulations, analyzes and information technologies, supporting architectural and urban design;

B.U4. develop solutions for individual building systems and elements in terms of technology, construction and materials;

B.U5. make a preliminary economic analysis of planned engineering activities;

B.U6. properly apply standards and legal regulations in the field of architectural and urban design.

Social competences

Student is capable of:

B.S2. reliable self-assessment, formulating constructive criticism regarding architectural and urban planning activities.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

As part of the design exercises, the student, working individually or in groups, must perform thermal calculations for the building, taking into account ventilation, and develop a selected issue in the field of ventilation and heating installations. The basis for passing the exercises is to check the correctness of the project and the issue being developed, and to defend the project in the form of a test on the eMoodle platform.

Assessment scale: 2,0; 3.0; 3.5; 4.0; 4.5; 5.0

Tutorials:

Formative assessment:

periodic control of learning progress (tests), active participation in classes

Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.

Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).

Summative assessment:

a final test

Accepted grading scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0.

Percentage of grades: 0–50% - 2.0 (insufficient); 50-60% - 3.0 (sufficient); 60-70% - 3.5 (sufficient plus); 70-80% - 4.0 (good); 80-90% - 4.5 (good plus); 90-100% - 5.0 (very good).

Programme content

The curriculum covers methods of thermal calculations of building partitions and design heat load calculations (heat loss through transmission and ventilation) of buildings, as the basis for further design of heating and ventilation systems. The student also learns the trends in the design of buildings with the lowest possible energy consumption and develops a selected installation issue in the area of heating and ventilation systems.

Teaching methods

Individual practical project.

Bibliography

Basic

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. Mùrmann H. Wentylacja mieszkań. Wentylacja regulowana z odzyskiem ciepła. Wyd. Instalator Polski Warszawa 2001.

5.. E-skrypt dla przedmiotu „Instalacje budowlane – ogrzewanie i wentylacja” (w opracowaniu).

Legal acts:

1.PN –EN ISO 6946 Building components and building elements. Thermal resistance and heat transfer coefficient. Calculation method.

2. PN –EN 12831 Heating installations in buildings. Design heat load calculation methods.

3. PN –EN ISO 13790 Thermal performance of buildings. Calculation of thermal energy for heating 4. PN-78 / B-03421. Ventilation and air conditioning. Calculation parameters of indoor air in rooms intended for permanent human habitation

5. PN-B-03430: 1983. Ventilation in residential buildings of collective housing and public utility buildings. Requirements.

Additional

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. EWFE Gdańsk 2008.
3. Gutkowski K. Chłodnictwo i klimatyzacja. Wyd. N–T Warszawa 2003

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	10	0,5

[1] delete or add other activities as appropriate