COURSE DESCRIPTION CARD - SYLLABUS

Course name
Building Systems - Heating and Ventilation [S1Arch1>IBOiW]

Course

Field of study
Architecture

Year/Semester
2/4

Area of study (specialization)
–

Profile of study
general academic

Level of study
first-cycle

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
0

Laboratory classes
0

Other
0

Tutorials
0

Projects/seminars
0

Number of credit points

1,00

Coordinators

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Lecturers

Prerequisites

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

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.

Course topics

1. Introduction, discussion of examples.
2. Analysis of building projects.
3. Calculations of building partitions.
4. Calculations of heat losses - transmission part 1 - walls, roofs, windows.
5. Calculations of heat losses - transmission part 2 - floors on the ground.
6. Calculations of ventilation heat losses.
7. Final board.

Teaching methods

Individual practical project.

Bibliography

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.

Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,00
Classes requiring direct contact with the teacher	15	0,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	10	0,50