



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Building Physics - Thermal Transmittance [S1Arch1>FBT]

### 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

2,00

### Coordinators

mgr inż. Jerzy Kosmatka  
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### Lecturers

### Prerequisites

1 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

- acquiring the latest knowledge in the field of heating, ventilation and air conditioning in residential and industrial buildings, - learning about the method of calculating the thermal load in buildings and other methods of thermal-flow and hydraulic calculations in the designed installations, - learning the rules for selecting devices to the sizes calculated in the designed heating, ventilation and air conditioning systems, - gaining skills in the field of creativity in evaluation in the design of heating, ventilation and air conditioning installations

## 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:

An exam in the form of a test is conducted as a way to check the learning outcomes from the lectures.

Assessment scale: 2,0; 3,0; 3,5; 4,0; 4,5; 5,0

## Programme content

As part of the education program, the student listens to lectures, from which he obtains the necessary information on the physics of buildings in terms of the impact of individual solutions on the energy consumption of the building.

The student also learns about technical and legal regulations and requirements for ventilation, heating, cooling and fire ventilation installations. The types of elements and devices used in the mentioned installations as well as basic diagrams and materials are discussed.

## Course topics

1. Gravity ventilation.
2. Elements of air distribution in rooms.
3. Air intakes and exhausts. Heating and cooling.
4. Adjustment of parameters in rooms. Ducts with accessories.
5. Basic ventilation schemes. Selected examples of solutions.
6. Ventilation units. Ventilation engine rooms. Air curtains.
7. Fire ventilation - basics.

8. Fire ventilation - solutions.
9. Room heating - radiators.
10. Room heating - surface.
11. Traditional heat sources.
12. Heat pumps.
13. Ecological solutions.

### Teaching methods

Lecture with a multimedia presentation and access to materials in the form of slides and lecture recordings.

### Bibliography

#### Basic

1. Koczyk H. , i inni. Ogrzewnictwo praktyczne, projektowanie, montaż, certyfikacja energetyczna, eksploatacja.
2. Krygier K. , i inni. Ogrzewnictwo. Wentylacja. Klimatyzacja.
3. Gaziński B. Technika Klimatyzacyjna dla praktyków, komfort cieplny, zasady obliczeń i urządzenia.
4. Mürmann H. Wentylacja mieszkań. Wentylacja regulowana z odzyskiem ciepła.

#### Additional

1. Nantka M. Ogrzewnictwo i ciepłownictwo. Tom I i II.
2. Recknagel, Sprenger i inni. Ogrzewanie i klimatyzacja. Poradnik.
3. Gutkowski K. Chłodnictwo i klimatyzacja.

### Breakdown of average student's workload

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 50    | 2,00 |
| Classes requiring direct contact with the teacher   | 30    | 1,00 |
| Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation) | 20    | 1,00 |