



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

History of energy-efficient buildings

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### Course

Field of study

Environmental Engineering

Area of study (specialization)

Heating, Air Conditioning and Air Protection

Level of study

Second-cycle studies

Form of study

part-time

Year/Semester

2 / 4

Profile of study

general academic

Course offered in

Polish

Requirements

elective

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### Number of hours

Lecture

8

Laboratory classes

Other (e.g. online)

Tutorials

Projects/seminars

### Number of credit points

1

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### Lecturers

Responsible for the course/lecturer:

Andrzej Górka, PhD

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Faculty of Environmental Engineering and

Energy

ul. Berdychowo 4, 61-131 Poznań

Responsible for the course/lecturer:

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### Prerequisites



Knowledge of general history at high school level. Basic knowledge of architecture and construction at the 1st cycle studies. Knowledge of heating, automation elements, energy management and renewable energy sources at the level of first-cycle studies.

### Course objective

Getting to know the history and evolution of energy-efficient buildings in Poland, Europe and the world.

### Course-related learning outcomes

#### Knowledge

The student has knowledge of technical solutions for reducing energy demand in buildings in subsequent historical periods.

#### Skills

The student is able to assess the type of construction and installation solutions and the level of energy efficiency of the building based on the time of its construction.

#### Social competences

Awareness of the importance of knowledge of history and its impact on the life of modern man and on the quality of buildings.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The knowledge acquired in the lecture is verified by a written final test in the last class. Required minimum of 50% points.

### Programme content

Historical outline of construction. Historical methods of thermal protection design and HVAC installations design in buildings. Historical methods and parameters for assessing the quality of buildings. Historical building solutions and their assessment in terms of energy consumption. Historic installation solutions and their assessment in terms of energy consumption. Passive house standard - the circumstances of its creation, development and current state. History of the use of renewable and unconventional energy sources. The impact of automation and control on energy demand for buildings - awareness of the problem in the history of construction and today.

### Teaching methods

Lecture with multimedia presentation

### Bibliography

#### Basic

Mielnicki S., Centralne ogrzewanie : regulacja i eksploatacja, Warszawa : Arkady, 1974

Kwiatkowski J., Cholewa L. Centralne ogrzewanie : pomoce projektanta, Warszawa : Arkady, 1980.

Feist W.: Podstawy budownictwa pasywnego. PIBP Gdańsk 2007.



Recknagel H., Sprenger E., Schramek E.R.: Kompendium wiedzy: ogrzewnictwo, klimatyzacja, ciepła woda, chłodnictwo, Wydawnictwo Omni Scala, Wrocław 2008.

PN-91/B-02020 – Ochrona cieplna budynków.

PN-B-02025 – Obliczenia sezonowego zapotrzebowania na ciepło.

PN-EN 832: 2001 Właściwości cieplne budynków - Obliczanie zapotrzebowania na energię do ogrzewania - Budynki mieszkalne

#### Additional

Kołodziejczyk S.: Zasady doboru grubości murów z cegły do stref klimatycznych Polski, Inż. i Bud. 1949, Biul. IBB 1949, nr 41

Rietchel /Raił, Ogrzewanie i Klimatyzacja, Wyd. Arkady 1972

PN-57/B-02403 – Najniższe temperatury obliczeniowe otoczenia budynków nieogrzewanych przestrzeni zamkniętych.

PN-57/B-03404 – Współczynnik przenikania ciepła K

PN-64/B-02402 – Temperatura obliczeniowa pomieszczeń ogrzewanych w budynkach.

PN-64/B-03404 – Współczynnik przenikania ciepła K dla przegród budowlanych

PN-82/B-02020 – Ochrona cieplna budynków.

Sear F., Roman Architecture, Cornell University Press, 1983

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	25	1,0
Classes requiring direct contact with the teacher	8	0,5
Student's own work (literature studies, preparation for tests) <sup>1</sup>	17	0,5

<sup>1</sup> delete or add other activities as appropriate