COURSE DESCRIPTION CARD - SYLLABUS

Course name
Humanistic aspects of energy efficiency

Course

Field of study
Environmental Engineering Second-cycle Studies
Area of study (specialization)
Heating, Air Conditioning and Air Protection
Level of study
Second-cycle studies
Form of study
full-time

Year/Semester
1/2
Profile of study
general academic
Course offered in
polish
Requirements
elective

Number of hours

Lecture
15
Laboratory classes
Other (e.g. online)
Tutorials
Projects/seminars

Number of credit points

1

Lecturers

Responsible for the course/lecturer:
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Faculty of Environmental Engineering and Energy

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Responsible for the course/lecturer:

Prerequisites

1.Knowledge: He/she can define and describe the scope of environmental engineering tasks. He/she understand function of designed objects/systems and their operating principle.

2.Skills: He/she can design the majority of objects in the field of environmental engineering.

He/she can recognizes and distinguishes the desirable and side-effect impacts of environmental engineering objects on human physiology.

3.Social competencies

He/she is aware of the complexity of human needs.

He/she design process is based on both the investor and the entire social environment needs.

Course objective

Learning about: the impact of human behavior on processes related to energy consumption in buildings, methods of testing and modeling these behaviors, and their consideration in energy assessment

Course-related learning outcomes

Knowledge

1. He /she knows humanistic concepts which describe human?technology interaction in the field of environmental engineering - [KIS2_W08]

2. He /she knows how a human can affect the effectiveness of engineering objects in the field of environmental engineering - [KIS2_W08]

3. He /she knows the ways and methodology of technical objects evaluation from user perspective - [KIS2_W08]

4. He knows where to get knowledge about the people lifestyle and knows how to apply it in practice - [KIS2_W08

Skills

1. He /she can to combine the functions of the building with building elements - [KIS2_U20]

2. He /she can combine the functions of technical solutions in the field of environmental engineering with the needs of users and indicate potential sources of problems during use - [KIS2_U20]

3. He /she can predict unplanned ways of using technical objects in the field of environmental engineering - [KIS2_U20]

Social competences

1. He /she understands and recognizes the needs of cooperation with both experts in the construction industry and specialists in the field of ergonomics, human resource management, cognitive scientists, sociologists and psychologists - [KIS2_K05]

2. He /she can talk with layman and detect his/her needs regarding the designed technical objects, as well as teach his/her how to use these objects - [KIS2_K05]

3. He /she is aware the need for systematic deepening and extension of his/her competences based on technical and scientific literature - [KIS2_K05]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture

The knowledge gained during the lecture will be used to prepare the study using a selected technique (survey, interview, observation, etc.).

The assessment will be based on the presentation of the results of simple studies (surveys, interviews, observations ...) carried out by group of students using one of proposed technique.

The assessment will take into account (points in brackets, sum = 12):

- independence in choosing the research goal (1),

- aptness research tools, preparation of research tools (surveys, questions, observations in the field ...) (3);

- aptness test group (population) and the representativeness (3);

- way of data analysis (3);

- comparison with the literature and final conclusions (2).

Rating:

56% - 65%: 3.0

66% - 75%: 3.5

76% - 85%: 4.0

86% - 95%: 4.5

96% - 100%: 5.0

Programme content

USER/OCCUPANT MODELS

1)Mathematical models, clustering

2)Concepts of human behavior in the context of using technical devices

INFLUANCE OF USERS/OCCUPANTS ON OBJECT ENRGY PERFORMANCE

3)Relevance of assumptions regarding user behaviour in the design process on the example of technical building systems.

MAN-MACHINE

4)The structure of devices and their functions

5)Interface design of everyday devices, examples

RESERACH METHODS

6)Post occupancy evaluation

7)Surveys, interviews, observations, applications

Teaching methods

Informative lecture with seminar elements, lecture with multimedia presentation

The use of research tools: survey, interviews, observation in the field

Discussion

Bibliography

Basic

1. O'Brien W. , Gunay H.B. The contextual factors contributing to occupants' adaptive comfort behaviors in offices ? A review and proposed modeling framework, Building and Environment, 77 (2014)

2. Ouf M. M., O'Brien W. , Gunay H.B., On quantifying building performance adaptability to variable occupancy, Building and Environment, 15 (2019)

3. IEA EBC - Annex 53 - Total Energy Use in Buildings: Analysis & Evaluation Methods, https://www.iea-ebc.org/projects/project?AnnexID=53

4. IEA EBC - Annex 66 - Definition and Simulation of Occupant Behavior in Buildings, https://annex66.org/ .

5. IEA EBC - Annex 79 - Occupant-Centric Building Design and Operation, http://annex79.iea-ebc.org/

6. Exploring Occupant Behavior in Buildings. Methods and Challenges, red. Wagner A., O?Brien W., Dong B., Springer 2018

7. Cholewa T., Siuta-Olcha A.: Racjonalizacja zużycia energii w budownictwie mieszkaniowym, Warszawa, 2016

8. Ajzen I., The theory of planned behavior, Organizational Behavior and Human Decision Processes., 50 (1991)

Additional

1. Heshong L., Thermal Delight in Architecture, The MIT Press 1979

2. Energy and Social Science Research, https://www.journals.elsevier.com/energy-research-and-social-science

3. O'Brien et al., Advancing Occupant Modeling for Building Design & Code Compliance: Part 1-3, ASHRAE Journal, 3-4, 2019

4. O'Brien et al., Advancing Occupant Modeling for Building Design & Code Compliance: Part 1-3, ASHRAE Journal, 3-4, 2019

5. D'Oca et al., Synthesizing building physics with social psychology: An interdisciplinary framework for context and occupant behavior in office building, Energy and Social Science Research, 34 (2017)

6. von Grabe J., Decision models and data in human-building interactions, Energy and Social Science Research 19 (2016

Breakdown of average student's workload

	Hours	ECTS
Total workload	30	1,0
Classes requiring direct contact with the teacher	15	0,5
Student's own work (literature studies, preparation for credit [1]	15	0,5

[1] delete or add other activities as appropriate