



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Indoor microclimate and air quality

### 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

part-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

8

Tutorials

Projects/seminars

8

### Number of credit points

2

### Lecturers

Responsible for the course/lecturer:

Katarzyna Ratajczak, Ph.D.

email: katarzyna.m.ratajczak@put.poznan.pl

tel. (61) 647 58 23

Institute of Environmental Engineering and  
Building Installations

Berdychowo 4, 61-131 Poznań

Responsible for the course/lecturer:

### Prerequisites

Basic knowledge of air parameters influencing thermal comfort. Basic knowledge and skills related to designing HVAC installations and their influence on thermal comfort in rooms.

### Course objective

Systematisation of knowledge in the field of indoor microclimate and air quality and acquisition of skills in the assessment of microclimate and indoor air quality in terms of indicators for assessing the internal



environment, as well as acquiring skills in measuring and evaluating the results of measurements of parameters falling within the scope of the TAIL indicator.

### Course-related learning outcomes

#### Knowledge

The student has knowledge of various indicators for assessing the microclimate and air quality in various types of rooms.

The student has knowledge of modern methods of assessing the indoor environment of rooms.

The student knows the influence of the parameters of the internal environment on the effectiveness of work and rest.

#### Skills

The student is able to define the comfort parameters for selected types of rooms and evaluate the results of the measurements carried out in the light of the applicable standards, regulations and recommendations.

The student is able to compare the design assumptions of the installation with microclimate and air quality measurements and conclude about the correct operation of the installation on the basis of this comparison.

The student has skills in planning measurements of internal environment parameters in order to assess the condition of the internal environment in selected rooms.

The student is able to measure the air parameters, which are included in the TAIL indoor environment assessment index.

The student is able to prepare a report on exercises and conducted experiments, in which he presents the results in a clear and specific way on graphs, taking into account the standards, regulations and recommendations as well as the results published in scientific journals.

Ability to work in a group to prepare a study related to the implementation of tasks.

#### Social competences

Awareness of the influence of designed installations on the microclimate of rooms and air quality.

Awareness of the changing guidelines for the design and assessment of the indoor environment following the latest scientific research.

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Tutorials: preparing a report on the performed tasks. Tasks performed during classes should be presented and supplemented with tasks performed outside classes. The report containing the basic elements defined in the first class is graded as good. Including additional elements in your report, including referencing the results to the latest scientific research increases the rating. Not taking into



account all the elements or making the report difficult to read, without formulating complete conclusions, lowers the baseline score. The exercise report is prepared in groups of 4-5 people.

Laboratories: pre-class entry on a given issue (written test), obtain 50% of the possible points and a report on the exercise, which takes into account the diligence of execution, completeness of execution, proper selection of charts, tables and description of the experiment as well as the completeness and clarity of conclusions. The basic report is graded as good, and references to research increase the grade, while deficiencies in the report lower the grade. The grade for each exercise takes into account the average entry grade and report. The report is prepared in teams implementing a given task (4-5 people).

### Programme content

1. Climatic comfort - systematization of issues related to climatic comfort: thermal comfort, acoustic comfort, light comfort, air quality - theoretical knowledge
2. Indicators for assessing the indoor environment of rooms - room microclimate and air quality (including microbiological) - for selected types of rooms
3. TAIL - a new indicator for the assessment of the internal environment - scope of application, parameters taken into account
4. The influence of the microclimate and air quality on the efficiency of work and rest - examples
5. Survey as a method of assessing the internal environment
6. Indicators for assessing the internal environment in practice: - measurement of parameters influencing the climatic comfort of the room - determination of PMV and PPD indicators for selected rooms, for various activities of people - assessment of the parameters of the internal environment of selected rooms in terms of selected indicators - possibly measurements of microbiological air quality - TAIL indicator determination

### Teaching methods

Presentations, case study, discussion, tasks for independent solution, measurement techniques.

### Bibliography

Basic

Katarzyna Gładyszewska-Fiedoruk, Dorota Anna Krawczyk. Mikroklimat pomieszczeń biurowych : badania empiryczne i ankietowe : studium przypadku

Parametry wejściowe środowiska wewnętrznego dotyczące projektowania i oceny charakterystyki energetycznej budynków, obejmujące jakość powietrza wewnętrznego, środowisko cieplne, oświetlenie i akustykę PN-EN 15251 / Polski Komitet Normalizacyjny.

Jarosław Müller. Zabezpieczenie klimatu wewnętrznego obiektów szkolnych w warunkach smogu.

Bernard Poędnik. Zanieczyszczenia a jakość powietrza wewnętrznego w wybranych pomieszczeniach.



Wybrane artykuły naukowe dotyczące mikroklimatu pomieszczeń i jakości powietrza - dostępne na eKursie przedmiotu

Additional

Wybrane referaty z konferencji: Problemy jakości powietrza wewnętrznego w Polsce - dostępne na eKursie przedmiotu

### Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,0
Classes requiring direct contact with the teacher	16	0,5
Student's own work (literature studies, preparation for laboratory classes, preparation for tests, additional homework prescribed by the teacher) <sup>1</sup>	34	1,5

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