
Course title: VENTILATION AND AIR CONDITIONING

ECTS credit allocation (and other scores): 4.0

Semester: autumn

Level of study: ISCED-6 - first-cycle programmes (EQF-6)

Branch of science: Engineering and technology

Language: English

Number of hours per semester: 15/30

Course coordinator/ Department and e-mail: dr inż. Anna Nowicka/Department of Environmental Engineering/anna.grala@uwm.edu.pl

Type of classes: classes and lectures

Substantive content

CLASSES: Student will learn the basic principles of designing the ventilation and air-conditioning system, learn to select the parameters of external and internal air, calculate the amount of ventilation air, select devices and pipes, and plan ventilation air distribution. Each student will receive a design of a single-family house ventilation with the use of heat recovery (recuperation). He will learn to design ventilation and air conditioning systems using applicable standards, technical and calculation procedures, catalog cards of modern ventilation and air conditioning devices.

LECTURES: The series of lectures is devoted to theoretical as well as factual information on the tasks of ventilation and air conditioning, ventilation and air conditioning systems and the requirements posed to them. The concept of thermal comfort, heat and moisture gains and pollutants in the room will be discussed, methods of calculating the amount of ventilation air will be explained, methods of air separation in a ventilated and air-conditioned room, etc. will be presented. ventilation and air-conditioning units, fans, air intake, exhausters, heaters, humidifiers, coolers, ventilation ducts, measuring fittings, etc.

Learning purpose: Acquainting with the problems of ventilation and air conditioning of residential and public utility rooms, the ability to select individual parameters of systems and devices.

On completion of the study programme the graduate will gain:

Knowledge: He knows the principles and purposes of using ventilation and air conditioning systems. Explains the basic hygrothermal changes in ventilation air. Defines the concept of thermal comfort. Has theoretical knowledge of air movement in ventilation ducts and in ventilated rooms. He knows the processes that are the basis for the design of ventilation and air conditioning systems, has knowledge about the operation of the systems.

Skills: He can assess the thermal comfort depending on the purpose of the ventilated room. Selects the size of the fan (air handling unit or air conditioning unit), ventilation regulation system. It uses the i-x chart, fan characteristics (AHU), diffusers and exhausts, and designs simple ventilation systems. Calculates heat, moisture and other air pollutants as well as the amount of ventilation air, aerodynamic resistance of the ventilation system. Has the ability to self-educate.

Social Competencies: Understands the impact of properly designed ventilation and air conditioning systems on the quality of human life.

Basic literature:

- 1) Jones W. P., Klimatyzacja, wyd. Arkady, 1981;
- 2) Przydróżny, S., Wentylacja, wyd. Politechnika Wrocławska, 1991;
- 3) Mührman, W., Wentylacja mieszkań, wyd. Instalator Polski, 2001;
- 4) Pełech, A., Wentylacja i Klimatyzacja

Podstawy, wyd. Oficyna Wydawnicza Politechniki Wrocławskiej, 2013; 5) Krygier, K., Klinke, T., Sewerynik, J., Ogrzewnictwo, wentylacja i klimatyzacja, wyd. wydawnictwa Szkolne i Pedagogiczne WSiP, 1995

Supplementary literature:

1) Malicki, M., Wentylacja i klimatyzacja, wyd. PWN, 1980; 2) Szymański, T., Wasiluk W., Wentylacja użytkowa poradnik, wyd. I.P.P.U. MASTA Sp. z o.o., 1999

The allocated number of ECTS points consists of:

Contact hours with an academic teacher: 1.96

Student's independent work: 2.04