Low Temperature Heating – High Temperature Cooling
REHVA Guidebook nr 7

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Contents of the course:

The objective of the course is to be able to understand different concepts of high temperature cooling and low temperature heating of buildings and how these types of systems can be applied in residential, commercial and industrial buildings.

The course will include the basic concept of water based radiant, heating and cooling systems in residential, commercial and industrial buildings and focus on the use of low temperature heating and high temperature cooling systems combined with the use of renewable energy sources.

First of all the influence of radiant heating and cooling systems on the indoor environment (ISO EN 7730, EN15251, operative temperature, mean radiant temperature, radiant temperature asymmetry, max-min surface, etc.) It will be demonstrated how this influence can be determined at the design stage by calculations.

Established methods for the calculation of the design heating and cooling capacity for water based radiant heating/cooling (floor, wall, ceiling) according to EN 15377 is presented
The course will deal with concept for design, dimensioning, and control of the different type of systems in residential, commercial and industrial buildings.

Different methods for estimation of the cooling and heating capacity will be presented

The advantage of large surface radiant heating and cooling systems, which are operated at water temperatures close to room temperatures is the ability to use low quality energy (waste heat, solar energy, ground heat exchanger, geothermal) and to increase the yearly energy performance of condensing boilers, heat pumps, absorption heat pumps, chillers etc.

Besides the course deals with the overall relation between building and system and overall primary energy performance of building and heating/cooling system and optimization for the use of low temperature heating high temperature cooling systems and renewable energy sources
During the course different applications and examples from existing buildings will be presented.