Bachelor Themes SFE – branch D
Thematic area: Building services engineering

GROUP 1 – Sanitary installations and heating

1) Flow of fluids and piping hydraulics
2) Sewage and its disposal methods
3) Public drainage systems and sewer networks
4) Internal drainage – typology, plumbing fixtures
5) Internal drainage – piping system, design and sizing
6) Internal drainage – draining of the underground fixtures
7) Water supply of buildings – public water main
8) Hot water demand, water properties
9) Internal water supply system – water supply connection, sizing
10) Internal water supply system – pipe, material, designing
11) Hot water supply – design of storage heater
12) Production and transport of gas, public gas piping
13) Heating gases, gas main, gas meter
14) Gas calculations – piping system sizing, gas consumption
15) Gas appliance – classification, location principles
16) Gas pipeline – piping network, sizing
17) Flue exhaust from gas appliances
18) Thermal comfort, resultant temperature, air temperature, design indoor and outdoor temperatures for heating system design
19) Space heating and heat emitters design
20) Energy performance of buildings - Calculation of energy and fuel use for space heating
21) Calculation of the design heat load
22) Water heating system design principles
23) Water heating system design sizing
24) Safety equipment of water heating systems
25) Domestic hot water supply
26) Heat sources – boiler plants
27) Heat sources – renewable sources
28) District heating network
29) District heating – heat transfer plants
30) Alternative and renewable heat sources
31) Electrical heating

GROUP 2 – Ventilation and electrical installation

32) Indoor environment in buildings and important parameters.
33) Hygienic requirements for building ventilation.
34) Fundamental design criteria and requirements for design of ventilation systems.
35) Basic division of ventilation systems, principles of natural and mechanical ventilation.
36) Requirements for ventilation of residential buildings.
37) Typical solutions for ventilation of residential buildings.
38) Fundamentals of ventilation of various spaces (offices, conference rooms, garages, etc.)
39) Principles of air-conditioning and cooling systems, basic types.
40) Moist air, parameters and basic relations.
41) Principles of moist air processes.
42) Moist air processes in the Mollier's chart.
43) Air handling units for ventilation, warm air heating and air-conditioning.
44) Components of ventilation systems – ducts, distributing elements.
45) Fire ventilation and principles of protection against fire transfer in ducts.
46) Application of moist air properties in central air-handling unit.
47) Operational states of air handling units.
48) Components of air-handling units.
49) Design of ductworks, materials and duct components.
50) Design of ductworks, calculation.
51) Design of distributing elements and types of air pattern in a room.
52) Plant room for air-handling unit – requirements, size, and readiness of building structures.
53) Air-handling unit requirements to other building services.
54) Artificial and combined illumination – fundamental physical and technical properties.
55) Illumination systems, light sources, light fittings, design methods.
56) Energy consumption of illumination systems – fundamental solutions, recommendations for consumer.
57) Indoor and outdoor electric installations – concept of electric systems, requirements.
58) Types of electric power networks in Czech Republic (principles, applications, examples in residential buildings).
59) Protection against lightning, overvoltage (concept, function, protective solutions).

Guarantee: K125
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