Plumbing

1. **Course number and name:** 020PLBES4 Plumbing

2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 contact hours per week

3. **Name(s) of instructor(s) or course coordinator(s):** André Kanaan

4. **Instructional Materials:** PowerPoint slides

   Textbooks/References:
   - DTU-60, Document technique unifié.
   - The National Plumbing Code.
   - ASHRAE Standard – Application handbook.
   - NFPA Standard, National Fire Protection Association.

5. **Specific course information**
   a. **Catalog description:**
   The aim of this course is to furnish students with a comprehensive understanding of plumbing applicable to various building structures. Students will possess the requisite knowledge to adapt to international plumbing standards and comprehend their diverse applications. They will gain insight into French standards based on the DTU (Unifier Technical Document), American standards, including the NFPA "National Fire Protection Association" standard for firefighting. The key topics covered in this course include calculations for the dimensions of water distribution pipes, the selection of pipe types, calculations for the dimensions of evacuation pipes, sizing of booster pumps and their operational mechanisms, rainwater calculations, sizing of domestic hot water tanks, and understanding fire hoses for sprinkler systems and fire cabinets, including their operational principles.

   b. **Prerequisite:** Hydraulics (020HYDES3).

   c. **Required** for ME students.

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
   A student who successfully fulfills the course requirements will have demonstrated an ability to:
      - Illustrate a plumbing diagram for a designated building and make informed selections for the suitable water distribution and evacuation systems.
      - Calculate the capacities of cold and hot water tanks.
      - Determine the size and select the type of cold water, hot water, hot water return pipes, and the associated circulation pumps.
      - Determine the appropriate sizing for rainwater drain pipes.

- Preliminarily determine the size and type of a fire system, considering the dimensions of the water pipes.

b. PI addressed by the course:

PI	2.1	2.2	2.3
Covered	x	x	x
Assessed	x	x	x

7. Brief list of topics to be covered

- **Chapter 1: Introduction.**
  - Definitions.
  - Types of pipes.
  - Types of valves.
  - Details of a water tank.
  - Differences between the French and American standard.
- **Chapter 2: French Standards DTU-60**
  - Calculations of cold-water distribution.
  - Calculations of hot water distribution.
  - Hot water return calculations.
  - Calculations of booster pumps.
  - Calculations of waste water evacuations, tap water.
  - Calculations of rainwater drainage.
- **Chapter 3: American Standards (National Plumbing Code)**
  - Definitions and general regulations.
  - Plumbing fixtures.
  - Water distribution networks.
  - Drainage system.
  - Venting system.
  - Storm water system.
  - Water heating service.
- **Chapter 4: Firefighting (NFPA standard)**
  - Introduction to NFPA 13 standard for sprinkler installation.
  - Introduction to NFPA 20, standard for fire pumps installation.
  - Introduction to NFPA 14, standard for standpipes and fire hydrant installation.
- **Chapter 5: Generalities**
  - Introduction to solar energy estimation.
  - Septic tanks, interceptors.
  - Introduction to irrigation systems.
  - Calculation of fuel piping.
  - Calculation of Gas networks and safety requirements.