COURSE TITLE: Equipment 1

TEACHING UNIT: EA5

WEEKLY HOURS: 1.5 hours (course), 1.5 hours (tutorial).

TOTAL SEMESTER LENGTH OF COURSE (in number of weeks): 14 weeks

FAIL MARK: < 05/20

COEFFICIENT: 2

FIELD/SPECIALISATION: Architecture

COURSE LANGUAGE: English

COURSE INSTRUCTORS [TEACHERS and ASSISTANTS]: Ghaffour W, Benabadji A S

GENERAL OBJECTIVE OF THE COURSE*

The Equipment 1 course focuses primarily on thermal comfort in buildings (heating, air conditioning, ventilation and air conditioning) and also covers other indoor installations such as sanitary plumbing (drinking water and drainage), gas installations, etc.

LEARNING OBJECTIVES *

- Understanding the principles of thermal comfort in buildings, including the concepts of heating, air conditioning, ventilation, and air conditioning.
- Identify and describe the various technical systems related to thermal comfort and indoor air quality.
- Analyse requirements for sanitary plumbing (drinking water supply, waste water disposal) and gas installations.
- Assessing the energy and environmental impact of technical equipment in order to promote sustainable solutions.

DESCRIPTION AND STRUCTURE* (AND TIMETABLE?)

Chapter I: Thermal phenomena

Climatic and thermal aspects, building thermal performance, modes of heat transfer, solar diagram.

Chapter II: Comfort in buildings

The thermal balance of buildings, thermal comfort, thermal comfort factors, indicators and comfort ranges.

Teaching commitments, Academic year 2025/2026, Wafa Belaid (born Ghaffour)

BIBLIOGRAPHICAL RESOURCES*

- D.T.R. Regulatory Technical Document (C 3-2) (1997). Thermal regulations for residential buildings Rules for calculating heat loss. Fascicule 1 Centre National d'Etudes et de Recherches Intégrées du Bâtiment.
- DTR Regulatory Technical Document C 3.4(1998) Rules for calculating heat gains
- in buildings AIR CONDITIONING Section 2. National Centre for Integrated Building Studies and Research (CENB)
- DTR regulatory technical document C 3.31 (2006) Natural ventilation. Premises for residential use. National Centre for Building Studies and Research
- ASHRAE Hanbook of Fundamentals Comfort Model (2005), superimposed on the climate of Brussels.
- Battaglia J-L, Kusiak A. and Puiggali J-R (2010) Introduction to heat transfer Lectures and corrected exercises. Dunod, Paris.
- Air conditioning and heating by zoning, Airzone, October (2012), http://conseils.xpair.com.
- Benjeddou, O. Jedidi, M. (2016) Building thermal engineering: from thermal comfort to the choice of heating and air conditioning equipment Dunod.
- Agostini P., H., (2018) Treatise on sanitary and thermal installations, Dunod.
- Gyéjacquot J-P (2016) Implementation of technical distribution networks: Water, electricity, gas, cooling, telecommunications, Le Moniteur.
- Liebard A. & de Herde A. (2005) Treatise on Bioclimatic Architecture and Urban Planning, Le Moniteur.
- Vinçotte asbl (2016), General regulations on gas installations, Vinquotte Edition.
- Bernard Legube (2021), Drinking Water Production - 2nd edition, Treatment Processes, Quality Parameters, Impacts of Climate Change, Dunod.
- Standard sanitation works (2017), reference guide for the design and management of sanitation works, edition, Greater Lyon.

COURSE ORGANISATION AND OPERATING PRINCIPLES*

Courses are held in the Department of Architecture of the Faculty of Technology every Wednesday starting at 8:30 a.m. Presentations are supplemented by informative explanations and discussions, exposing students to real-life examples to encourage them to apply themselves to their studies. Respect for teaching during lectures and tutorials is required.

Students are required to attend tutorials.

Continuous assessment tests are scheduled throughout the semester.

Chapter III: Heating and air conditioning equipment

Heating, boiler room layout, heating production equipment, air conditioning.

Chapter IV: Building ventilation and air quality

Natural ventilation, controlled mechanical ventilation, technical ducts.

Chapter V: Drinking water supply

External water distribution network, components of an internal distribution system, internal distribution methods, AEP sanitary plumbing.

Chapter VI: Building sanitation systems

Urban effluents, criteria for choosing a sanitation system, sanitation structures, principles of sewer layout, internal sanitation network.

Chapter VII: Gas installations and technical requirements for architectural design

Safety rules, gas supply and shut-off, regulations.

Chapter VII: Fire protection, firefighting and evacuation

Fire prevention measures, passive prevention, active prevention, fire safety systems, firefighting measures, evacuation.

COURSE MATERIALS

PowerPoint presentation with photos and video illustrations. Students are provided with course materials in digital format.

PRE-REQUIS*

-General concepts of building physics.

-General concepts of building physics relating to thermal phenomena.

INSTRUCTIONS FOR INDIVIDUAL OR GROUP ASSIGNMENTS

The tutorials are divided into two parts: one part is carried out in class in the form of exercises, and the second consists of an individual assignment to be submitted to the teacher.

EVALUATION*

The assessment covers four aspects:

- Evaluation of continuous assessments (an average of two),
- Ongoing evaluation of attendance and participation,
- Evaluation in the final exam.

The final assessment is based on the following weightings:

Note 1: Average (one test + attendance and participation grade + presence grade + grade for submitted work and/or presentation)

Note 2: Synthesis Exam

Overall evaluation: 60% Final Exam + 40% Continuous Assessment.

INFORMATIONS SUR LES SERVICES COMPLEMENTAIRES

The course material is available on the "Teams" platform in PDF format.

The course handouts can be accessed on the Faculty of Technology's Moodle (E-learning) platform.

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***Mandatory Sections**