

HVAC 1

1. Course number and name: 020CL1ES3 – HVAC 1
2. Credits and contact hours: 4 credits, 2x1:15 course hours
3. Instructor's or course coordinator's name: Said Chehab
4. Text book :
 - a. other supplemental materials: Power Point Presentations, softwares, Professor Text Book
5. Specific course information
 - a. brief description of the content of the course (catalog description)

This course aims to introduce and present the air conditioning, heating and ventilation systems and technologies. It covers all the aspects related to the thermal comfort such as the humid air treatment, use of the psychometric chart, thermal building envelop and focuses mainly on heating systems: heating load calculation, selection and sizing of the various existing systems: central hot water system, Heat Pumps, Air handling Unit, boilers ,pipes, pumps, fans,...
 - b. prerequisites or co-requisites: Thermodynamics and Fluid Mechanic,
 - c. Required/Elective/Selected Elective: Required
6. Specific goals for the course
 - a. - Enable the student to design, select, install and quote a complete Heating system (central hot water heating systems, Ventilation systems, optimization of the thermal building envelop...)
 - Design Urban Heating Systems
 - Operation and Maintenance of big heating systems (boilers, burners,...)
 - b. KPIs addressed by the course.

KPI	b1	b3
Covered	x	x
Assessed	x	x
Give Feedback		

7. Brief list of topics to be covered and approximate lecture hours :
 - Course introduction, (1 Lecture)
 - Thermal Comfort: thermal and hydrothermal exchange.
Interior Basic conditions, Exterior Basic conditions. Comfort elements: activity, clothes, hygrometry, radiation, temperatures, (3 Lectures)

- Psychometric Chart : calculation and dimensioning of Heating, Cooling, Humidifying, Dehumidifying systems for interior ambient (4 Lectures)
- Load Estimation for Heating taking in account the impacts of ventilation, wall insulation, glazing treatment, lighting and equipment heating production,... (5 Lectures)
- Central Heating using Hot Water : Presentation, design and sizing of radiators, fan-coils, floor heating, convectors, pipes, pumps, boilers, burners, domestic hot water, fuel tanks, chimney, ... (9 Lectures)
- Heating with hot air: Production of hot air, Air Handling Unit, Fan coil unit. Presentation, design and sizing using the psychometric chart of heating coils, humidifiers, air filters, fans, mixing box. (5 Lectures).

