Home Automation

1. **Course number and name:** 020DOMES3, Home Automation.

2. **Credits and contact hours:** 4 ECTS credits, (2 lectures per week) x 1:15.

3. **Instructional materials:** Antoine SAWAYA

4. **Instructional materials:**
   - Instructor's Class Notes.
   - KNX systems Arguments and Basic concept (KNX Associations)

5. **Specific course information**
   a. **Catalog description:** Provide the necessary elements to: Basic of home automations, existent protocols, concept of typical automation projects, related electrical drawings, list of devices, implementation of the devices into the tools software.
   b. **Prerequisites:** none
   c. **Selected Elective** for EE students.

6. **Specific goals for the course**
   a. **Specific outcomes of instruction:**
      − Introduce the students to the basics of home automation.
      − Present communication modes, complete the type of existent protocols.
      − Enhance the relation between home automation and internet of things (IOT)
      − Develop the type of control per different load such as lighting, electrical shutters, HVAC, and Audio video equipment.
      − Interface with other related systems such as BMS, intrusion, Access control, CCTV and Fire Alarm.
      − Introduce the User interface for the home automation system.
      − Expose students to the regulation of electrical installation related to the home automation requirements.
      − Familiarize the students to home automation equipment.
      − Enhance the student to understand the KNX protocol complete with the ETS software.
      − Concept of the Home Automation project in terms of marketing/sales and technical themes.

   b. **PIs addressed by the course:**

PI	1.1	1.2	1.3	2.1	2.2	2.3	2.4	2.5	4.2
Covered	X	X	X	X	X	X	X	X	X
Assessed	X	X	X	X	X	X	X	X	

7. **Brief list of topics to be covered:**
   - Introduction to Home Automation. (1)
   - Communication mode: Dry contact, Serial, Infra red and TCP-IP (2)
   - Protocol: Wired and Wireless, Dedicated and Universal. (2)
   - Type of control: Lighting, electrical curtains, HVAC and Audio video equipment. (4)
   - Interface with other systems: Building management systems (BMS), Fire Alarm, Intrusion, CCTV and intercom. (1)
   - Internet of things (IOT) (1)
   - User Interface: Binary input, Wired Keypads, Wireless remote control, Touch screen and Mobile / Tablet applications. (2)
   - Concept of electrical installation relative to home automation complete with the relative electrical panel. (1)
   - Load schedule with the number of circuits and type of control. (1)
   - Home Automation devices. (1)
   - KNX Protocol. (1)
   - ETS software. (2)
   - Concept of typical project (requirement and recommendations) (1)
   - Distribution of project on student
   - Evaluation on the project process per group of student. (4)