Computer-Aided Design

1. **Course number and name:** 020COANI4 Computer-Aided Design

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

3. **Name(s) of instructor(s) or course coordinator(s):** Melissa Said

4. **Instructional materials:** Projection of the Aspen HYSYS® software, simulations shared in PDF format, PowerPoint slides

   References:
   - Chemical Process Design and Simulation, J. Haydary, 2019
   - Analysis, Synthesis and Design of Chemical Processes Fifth edition, R. Turton et al., 2018

5. **Specific course information**
   a. **Catalog description:**
      This course is intended for chemical and petrochemical engineering students who are using Aspen HYSYS® for the first time. It will introduce them to process simulation and optimization and will familiarize them to the different features of HYSYS®. By the end of the lab, students should be capable of simulating basic chemical processes.

   b. **Prerequisites:** None

   c. **Required/Selected Elective/Open Elective:** Required

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
      - Define and understand process simulation.
      - Select a fluid package and components.
      - Add, specify, and connect material streams.
      - Analyze properties using Case Study.
      - Design and operate various units such as pumps, compressors, expanders, heat exchangers, separators, reactors, absorbers, separation columns…
      - Design and simulate a simple chemical process.

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

PI	1.2	2.1	6.1	7.1
Covered	x	x	x	x
Assessed	x	x	x	x

7. **Brief list of topics to be covered**
   - Introduction to Process Simulation and Starting with HYSYS®
   - Case Study

- Pump
- Compressor and Expander
- Heat Exchanger
- Flash Separator
- Conversion & Equilibrium Reactions
- Continuously-Stirred-Tank Reactor
- Absorber
- Separation Columns
- Simulation of a simple chemical process and mini economic evaluation