Modeling and Simulation

1. **Course number and name:** 020MOSCS3 Modeling and Simulation

2. **Credits and contact hours:** 2 ECTS credits, 1x1:15 contact hours

3. **Names of instructors:** Melissa Said

4. **Instructional materials:**
   - Projection of the Aspen HYSYS® software, simulations shared in PDF format…
   - 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 designed for chemical engineering students with some prior exposure to Aspen HYSYS®. It aims to deepen their understanding of process simulation while further introducing them to some new features of HYSYS®. Throughout the sessions, students will enhance their capability to simulate more complex chemical processes, building on the knowledge acquired in a previous course.

   b. **Prerequisites:** 020CADNI4 Computer Aided Design

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

6. **Specific goals for the course**

   a. **Specific outcomes of instruction:**
      - Understanding Aspen HYSYS® features and unit operations such as heat exchangers, reactors, recycle…
      - Design and optimize distillation columns.
      - Simulate different chemical processes to synthesize different chemical products including ammonia, ethyl chloride, n-octane and dimethyl ether.

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

PI	1.3	7.2
Covered	x	x
Assessed	x	x

7. **Brief list of topics to be covered**
   - Heat exchangers
   - Reactors
   - Distillation column design
   - Case study
   - Recycle

Ammonia synthesis
Ethyl chloride synthesis
n-octane production
Dimethyl ether production