Hydrostatics

1. **Course number and name:** 020STFNI2 Hydrostatics

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

3. **Name(s) of instructor(s) or course coordinator(s):** Cynthia Andraos, Pascale Abboud

4. **Instructional materials:** PowerPoint slides and course handouts.

5. **Specific course information**
   a. **Catalog description:**
      This course introduces the fundamental principles and concepts of fluid statics. It explores the behavior of fluids at rest and focuses on the study of forces and pressures exerted by fluids on immersed surfaces. Topics covered include hydrostatic pressure, buoyancy, hydrostatic forces on submerged surfaces, stability of floating and submerged bodies, and fluid statics applications. The course emphasizes problem-solving techniques, practical applications, and the development of critical thinking skills in the context of fluid statics.

   b. **Prerequisites:** None

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

6. **Educational objectives for the course**
   a. **Specific outcomes of instruction:**
      - Understand the fundamental principles and concepts of fluid statics.
      - Analyze and calculate hydrostatic pressures in fluids.
      - Determine the forces exerted by fluids on immersed surfaces.
      - Analyze the stability of floating and submerged bodies.
      - Apply fluid statics principles to solve real-world engineering problems.
      - Develop critical thinking and problem-solving skills in the context of fluid statics.

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

PI	1.2	1.3	6.4
Covered	x	x	x
Assessed	x	x	

7. **Brief list of topics to be covered**
   1. Introduction to Fluid Statics
      - Definition and properties of fluids
      - Applications of fluid statics
      - Units and dimensions

2. Pressure in Fluids
    - Pascal's law
    - Hydrostatic pressure
    - Manometry
3. Hydrostatic Forces
    - Forces on plane surfaces
    - Forces on curved surfaces
    - Forces in a multi-layers fluid
4. Buoyancy and Stability
    - Archimedes' principle
    - Stability of floating bodies
    - Stability of submerged bodies
5. Fluid Statics Applications
    - Dam Stability