Reinforced Concrete

1. **Course number and name:** 020BEAGS3 Reinforced Concrete

2. **Credits and contact hours:** 6 ECTS credits, 3x1.25 hours

3. **Name(s) of instructor(s) or course coordinator(s):** Wassim RAPHAEL

4. **Instructional Materials:**

    a. Instructor class notes
    b. EN 2004. "General rules and rules for building, Eurocode 2" – Design of concrete structures, Part 1
    c. FIB, "Structural Concrete: Textbook on Behaviour, Design and Performance, Updated Knowledge of the of the CEB/FIP Mod-el Code 1990," Bulletin No. 2, V. 1, Fédération internationale du béton (FIB), Lausanne, Switzerland, 1999

5. **Specific course information**
    a. Catalog description: Understand the behavior of reinforced concrete - Analyze, design and detail reinforced concrete elements by applying the Eurocode 2

    b. Prerequisites or co-requisites: 020RDMGS2 Strength of Materials

    c. Required: Required major course for Civil Engineering Specialty students

6. **Educational objectives for the course**
    a. Specific outcomes of instruction:
        - Properly apply EC2 code provisions
        - Analyze, design and detail reinforced concrete elements
        - Investigate serviceability requirements
        - Acquire the basics of sustainable practices
        - Identify the behavior and mode of failures of concrete members
    b. PI addressed by the course:

PI	1.1	1.4	2.2	3.1
Covered	yes	yes	yes	yes
Assessed		yes	yes	yes

7. **Brief list of topics to be covered:**
    1. Introduction (2.5 hours)
    2. Materials (Concrete – Reinforcing Steel) (5 hours)
    3. Durability and cover to reinforcement (5 hours)
    4. Detailing of members and particular rules (5 hours)
    5. Serviceability and Ultimate limit states (5 hours)

6. Design of ties – Crack limitations (7.5 hours)
7. Design of columns (5 hours)
8. Design of Beams (5 hours)
9. Design of members requiring shear reinforcement (5 hours)
10. Design of members submitted to Combined Axial Load and Bending (5 hours)
11. Overview of BAEL code (2.5 hours)