Course Syllabus

1. **Course number and name:** 020CHGNI1 General Chemistry
2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 course hours
3. **Instructor's name:** Jihane N. RAHBANI
4. **Text book:** *Chimie tout-en-un MPSI/PTSI, J'intègre-Dunod, 2013*
5. **Specific course information**
    a. **Catalog description:** The course covers chemical reactions and equilibrium. First, the reactions and equilibrium calculations of strong and weak acids and bases in aqueous solution are investigated. Then, the equilibrium of slightly soluble (or nearly insoluble) ionic compounds is presented. It is showed how to use the equilibrium constants to answer questions about solubility, precipitation, the effect of common ions and the effect of the pH on the solubility. The formation of complex ions and their effect on solubility of slightly soluble ionic compounds are covered. The oxidation-reduction reactions are also investigated. Understanding of oxidation–reduction reactions is applied to the study of voltaic cells. The last part of the course describes the Pourbaix diagram.
    b. **prerequisites or co-requisites:** None
    c. **Required/Elective/Selected Elective:** Required
6. **Specific goals for the course**
    a. **Specific outcomes of instruction:**
        - Determine the final composition of a solution when different acids and bases are mixed.
        - Calculate the pH of a buffered solution
        - Explain how the solubility product can be used to predict if a precipitate will form when two aqueous solutions are mixed.
        - Determine solubility of slightly soluble compounds in different solutions.
        - Describe a voltaic cell: identify the anode and cathode, which oxidation-reduction reactions will occur.
        - Use the Nernst equation to calculate the voltage of a voltaic cell.
        - Determine the capacity of a voltaic cell.
        - Plot a Pourbaix diagram.
    b. **KPIs addressed by the course:**

KPI	a1	a2	b1	b2	b3
Covered	x		x		
Assessed	x				
Give Feedback	x				

7. **Brief list of topics to be covered and approximate number of lectures:**
    1. Acid base equilibrium (8 lectures)
    2. Solubility equilibrium (8 lectures)
    3. Redox reactions (7 lectures)
    4. Pourbaix diagram (5 lectures)