

Course Syllabus

1. **Course number and name:** 020CHACI3 Advanced Chemistry
2. **Credits and contact hours:** 4 ECTS credits, 2x1:15 course hours
3. **Instructor's name:** Jihane Rahbani
4. **Text book:** *Chimie tout-en-un MP/PT, J'intègre-Dunod, 2014*
5. **Specific course information**
 - a. **Catalog description:** The course begins with a fundamental description of bonding in crystalline solids: ionic, metallic, covalent network, and molecular. The course also covers basic thermodynamics: heat transfer, Hess cycle, enthalpy and entropy, criteria for spontaneous change, chemical equilibrium - effect of change of temperature.
 - b. **prerequisites or co-requisites:** General Chemistry
 - c. **Required/Elective/Selected Elective:** Required
6. **Specific goals for the course**
 - a. **Specific outcomes of instruction:**
 - Describe a perfect crystal.
 - Give a brief definition of a unit cell.
 - Compare the properties of different types of crystalline solids.
 - To be able to state the First Law of thermodynamics and to define heat, work, thermal efficiency and the difference between various forms of energy.
 - Know the second law of thermodynamics and explain the role that entropy plays in determining whether a process will be spontaneous.
 - Discuss how the second law leads to the definition of Gibbs free energy.
 - Understand the theories in the evolution of chemical equilibrium.
 - 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. Crystalline solids (9 lectures)
 2. Basic concepts of thermodynamics (12 lectures)
 3. Evolution of chemical equilibrium (7 lectures)