

## **COURSE TITLE**

Chimica Fisica II  
Physical Chemistry II  
(Chemistry Bachelor)

Prof. Stefana Milioto (e-mail: stefana.milioto@unipa.it)  
Classroom site: Viale delle Scienze, Building 17, Room D

Credits (CFU) = 8

## **COURSE PROGRAM**

### **face-to-face lectures (64 hrs, 8 CFU)**

*Thermodynamics of non-ideal solutions. Non-ionic and ionic solutes. Partial molar properties evaluation from bulk properties and from the apparent molar properties: theories and experimental determination from direct measurements (calorimetry and densitometry). Experimental methods to determine the activity coefficients (methods based on the evaluation of the solvent activity and based on galvanic cells). Thermodynamics of ions in solution. Thermodynamics of regular solutions. Thermodynamics of nanostructured systems.*  
*Phase diagrams: systems composed of one, two and three components. Liquid/liquid, liquid/vapor and solid/liquid equilibria.*  
*Thermodynamic definition of the surface tension and its consequences. Isotherm of adsorption of Gibbs, La Place equation, spreading coefficients.*  
*Rheological properties: viscosity and its experimental determinations. Effect of solutes and temperature on the viscosity.*

## **TEXTBOOKS**

K. G. Denbigh, I principi dell'equilibrio chimico, II Ed.  
S. Glasstone, Trattato di Chimica Fisica. Manfredi Editore.  
R. Zana, surfactant in solutions. New methods of investigation. Marcel Dekker