

2021-2022	Common Core	Year 1 - Sem. 2
CHIM101	General Chemistry	Mandatory
ECTS: 3	Instructors: Dr. Carlos Youssef, Dr. Rami Nader, Dr. Zeinab Serhan, Dr. Aecha Elachi	Language: English/French
Total hours: 39 h	Period : March-June	

#### Description:

In this course, the student will learn the concepts of chemical thermodynamics, chemical and ionic equilibria in aqueous solution, redox and reaction dynamics.

#### Learning outcomes:

- Identify the characteristics of acids, bases and salts and solve problems based on their quantitative relationships.
- Identify and balance redox equations and solve redox titration problems.
- Determine the rate of a reaction and its dependence on concentration, time and temperature.
- Discuss the construction and function of electrochemical galvanic and electrolytic cells and determine the potentials of standard and non-standard cells.

#### Content:

##### I. ACIDS & BASES

DEFINITIONS AND BASIC CONCEPTS- ACID-BASE REACTIONS- pH DETERMINATION- BUFFER SOLUTION- ACID-BASE TITRATION

##### II. OXIDATION- REDUCTION

REDOX REACTIONS- ELECTRODE POTENTIAL; NERNST EQUATION- ELECTROCHEMICAL CELLS

##### III. THERMODYNAMICS

ENERGY, ENTHALPY AND THERMOCHEMISTRY - SPONTANEITY, ENTROPY AND FREE ENERGY- THERMODYNAMICS AND CHEMICAL EQUILIBRIUM

##### IV. KINETICS

REACTION RATES- RATE LAWS- DETERMINING THE FORM OF THE RATE LAW- THE INTEGRATED RATE LAWS- A MODEL FOR CHEMICAL KINETICS- CATALYSIS

#### References:

- The Molecular Nature of Matter and Change, Seventh Ed. by Silberberg et al., McGraw-Hill, 2015
- Principles and Modern Applications, 10<sup>th</sup> Ed. By Ralph Petrucci et al., Pearson Canada, 2011
- General Chemistry II, Second Ed. by John Hutchinson, 2011

#### Evaluation Method:

Assessment in the following areas will be converted to points, to compute your final grade in this course:

- Mid-Term
- Final Exam
- Home Works