

Theoretical and practical courses-Ilam University of Medical Sciences

Introduction of the course: Analytical Chemistry Theory of the second semester of the academic year
2020-2021

School: Health Department:

Course and degree: Bachelor of Biology and Control of Disease Carriers

Day, time and place:

Number and type of unit (theoretical): 2

Names of the person in charge of the course (teacher of the course): Elahe Karimi

Prerequisite courses: Office address: Biotechnology and Medicinal Plants Research Center

Phone and contact days: 09183403913

General Objective of the lesson: Identification and measurement of chemical compounds

Lesson Description: Basic Introduction to the Basic Concepts of Analytical Chemistry (Solution Sampling and Sample Solving)

Specific or partial objectives of the course:

At the end of this course, the student is expected to be able to:

- 1- Familiarity and acquisition of knowledge about atoms, matter and energy, knowledge of elementary particles and theories related to these particles up to the present time and electromagnetic radiation
- 2- Familiarity and acquisition of knowledge about different atomic models and the position of the periodic table, the electronic structure of elements and the dual position of electrons
- 3- Familiarity and acquisition of knowledge about atomic and ionic radius, bond length, electron seeking and electronegativity of elements

Student duties (student homework during the semester):

- 1- Active presence in the class
- 2- - Answering questions
- 3- Midterm exam
- 4- Lesson project
- 5- Practical activity and work report

The main sources of the lesson:

1- Basics of Decomposition Chemistry, Volumes I and II; Authors: Skook, West, Haller; Translators: Vida Tavassoli, Houshang Khalili and Ali Masoumi; University Publishing Center Publications; Sixth Edition

2- General Chemistry Volume II; Author: Charles Mortimer; Translator: Isa Yavari; University Science Publications; Sixth Edition

Teaching methods + teaching aids used:

Class boards, computers, video projectors, Excel software

Methods and time of assessment and evaluation of the student and the bar related to each evaluation:

- 5 marks with the coordination of students, 15 final marks in due time

Lesson rules and expectations from students:

Schedule and predicted contents of each theory session

Session	Topic	Necessary preparation of students before the start of the class
1	SI unit, mole, type of concentration, decomposition and equilibrium molarity, normality, percent concentration and part in million.....	Write a textbook, solve problems at home, participate in class and solve problems
2	Volumetric ration, functions p, density, special weight and dilution of solution	
3	Introduction to Decomposition Chemistry, Different stages of analytical analysis, Qualitative and quantitative analysis, Division of decomposition methods	
4	Errors in Analytical Chemistry, Some important terms, Accuracy and exactly, Types of errors, Certain errors and their types	
5	Characteristics of normal distribution curve, standard deviation of statistical population, captivity deviation, coefficient and deviation	
6	Relative standard, standard deviation of merged, error propagation in analytical analysis and practice solving exercise	
7	Statistical evaluation of analytical data, distances and reliability, methods of rejecting doubtful results, solving exercises	
8	Weighing methods, mechanism of sediment formation	
9	Introduction to aqueous solutions and chemical equilibrium, Effect of electrolyte on chemical equilibrium, Ionic strength, Acid and base equilibrium	
10	Types of equilibrium constants, oxidation-reduction equilibrium constant, acid-base constant, buffer solutions, buffer properties	

11	buffer capacity	
12	Types of detectors, their mechanism of action, range of action, practice solving exercise	
13	Effect of common ion, effect of temperature, effect of pH, effect of complex formation, separation of ions by controlling the concentration of precipitating anion	
14	Basic definitions in titration, titration curves, sediment titrations, the effect of different parameters on the shape	
15	- Titration curve, titration curve of mixed anions	
16	Acid and base titrations, neutralization titers, titration error, strong acid titration with strong base	
17	How to select the reagent, the titration curve of acids and bases is weak	