



Module Description

University of AL-Kafeel / College..... Academic Year (2020-2021)

Stage:	First stage
Specialization:	Pharmacy
Name of the Course in Arabic	الكيمياء التحليلية
Name of the Course in English	Analytical Chemistry
Goals:	To provide students with a theoretical background on chemical principles that are essential to practice chemical analysis. It enables students to understand the importance of judging the accuracy and precision of experimental data and techniques of quantitative analysis.
Description	Study the concepts and fundamentals of analytical chemistry, which plays a vital role in pharmacology studies. Specifically, this course aims to study some general terms and definitions, preparation of solutions and units for expressing concentration. The course is also to provide an understanding of chemical methods used for elemental and compound analysis, with focusing on quantitative analytical measurements.
Number of Theoretical lectures	Theory 3
Number of Practical lectures	Laboratory 2
Credits	4
Name of Instructor in Arabic	حسنين علي عباس (نظري) ولاء محمد نجم (عملي)
Name of Instructor in English	(نظري) Hasanain Ali Abbas (عملي) Walaa mohammed najem
Title	حسنين علي (مدرس) , ولاء محمد (مدرس مساعد)
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Curriculum / Theoretical:

Week	Syllabus
1	Review of elementary concept important to analytical chemistry: strong and weak electrolytes; important weight and concentration units.
2	Review of elementary concept important to analytical chemistry: strong and weak electrolytes; important weight and concentration units.
3	The evaluation of analytical data: definition of terms. An introduction to gravimetric analysis: statistical analysis of data; rejection of data; precipitation methods; gravimetric factor.
4	Continuing with gravimetric analysis
5	The scope of applications of gravimetric analysis: inorganic precipitating agents; organic precipitating agents.
6	An introduction to volumetric methods of analysis: volumetric calculations; acid-base equilibria and pH calculations.
7	An introduction to volumetric methods of analysis: volumetric calculations; acid-base equilibria and pH calculations.
8	Buffer solutions: theory of neutralization titrations of simple system.
9	Theory of neutralization titrations of complex system; precipitation titrations.
10	Calculation of pH in complex system; volumetric methods based on complex system.
11	Equilibria in oxidation-reduction system; theory of oxidation-reduction titrations.
12	Equilibria in oxidation-reduction system; theory of oxidation-reduction titrations.
13	Spectrophotometric analysis: an introduction to optical methods of analysis; methods based on absorption of radiation.

Curriculum / Practical:

Week	Syllabus
1	Demonstration of some laboratory equipments.
2	Separation and identification of group 1 cations (individual test).
3	Analysis of group 1 cations mixture.
4	Preparation and standardization of an acid.
5	Determination of the percentage of acetic acid.
6	Analysis of sodium carbonate and sodium hydroxide mixture.
7	Determination of chloride by the Mohr method.
8	Determination of chloride by the Volhard method.
9	Preparation and standardization of 0.1N KMnO_4 .
10	Determination of ferrous form of iron in Mohr's salt.
11	Determination of total hardness in tap water.
12	Gravimetric determination of Nickel.

References :

Main References :

[1] *Fundamentals of Analytical Chemistry by Stook and West.*

[2] **Handbook for Analytical Chemistry lab Adopted by the Department**

Secondary References:

[1] **Analytical Chemistry** by G. Christian, P. Dasgupta & K. Schug

[2] **Modern Analytical Chemistry** by D. Harvey