

Ministry of Higher Education and Scientific research



**Department of Petroleum Technology- Chemical Analyzing**

**Koya Technical Institute**

**Erbil Polytechnic University**

**Subject: Gravimetric analysis**

**Course Book – Semester 2**

**Lecturer's name: Yousif Taha Maarooif**

**Academic Year: 2023/2024**

## Course Book

1- Course name	Gravimetric analysis
2- Lecturer in charge	Dr. Yousif Taha Maarooif
3- Denartment/ College	Department of Petroleum Technology- Chemical Analyzing
4- Contact	
5- Time (in hours) per week	Theory: 2 Practical:3
6- Office hours	
7- Course code	GRA202
8- Teacher's academic profile	
9- Keywords	

### **10. Course overview:**

- ❖ This course aims to familiarize students with the principles of analytical chemistry and basic analytical techniques including gravimetric analysis. This course is not open to Chemistry or Analytical and Testing Sciences major students.
- ❖ Upon successful completion students should be able to facilitate the learner to make solutions of various molar concentrations. This may include: The concept of the mole; Converting moles to grams; Converting grams to moles; Defining concentration; Dilution of Solutions; Making different molar concentrations.

### 11. Course objectives:

- ❖ Experimental practice of quantitative gravimetric analysis.
- ❖ The objective of the determination of the concentration or the mass of the minimum formula from the titrated chemical material composing a pure liquid or a solution.
- ❖ The main objective of gravimetric analysis is to determine the amount of a substance in a given sample. When dealing with gravimetric analysis the concept of concentration cannot be avoided. Molarity i.e. moles per litre or decimeter is widely used unit of concentration.

### 12. Student's obligation

Students should read ahead and be prepared to ask/answer questions during class on the material as it is covered. gravimetric analysis is a general term for a method in quantitative chemical analysis in which the amount of a substance is determined by the measurement of the mass that the substance occupies. It is commonly used to determine the unknown concentration of a known reactant. In these cases, supplementary course material will be provided to the student either as handouts or as web links. during the academic year besides the assignment;

Pre-final: 50% = (30% exam + 20% activity + quiz)

Final Exam: 50%

### 13. Forms of teaching

Data show, PowerPoint and white board

### 14. Assessment scheme



Course objectives:

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

- 1- Understand the fundamentals of gravimetric analysis .
- 2- Follow the steps of the gravimetric analysis.
- 3- Choose the appropriate precipitating agent for a certain analyte .
- 4- Avoid or at least minimize the contamination of the precipitate.
- 5- Optimize the precipitation conditions in order to obtain a desirable precipitate .
- 6- Do all sorts of calculations related to gravimetric analysis .

**17. The Topics:**

- 1- The principles of gravimetric analysis
- 2- Properties of gravimetric analysis
- 3- Properties of the Precipitate and mechanism of precipitation
- 4- Steps of gravimetric analysis
- 5- Gravimetric factor (GF) calculations
- 6- Impurities encountered in gravimetric analysis
- 7- Filtration and washing of the precipitate
- 8- Drying, weighing and calculations in gravimetric analysis
- 9- Mathematical examples
- 10-Digestion of the Precipitate



## 19. Examinations:

### 1. Compositional:

In this type of exam the questions starts with explain? What are the reasons for..?

### 2. True or false type of exams:

### 3. Multiple choices.

## 20. Course reading list and references:

### Basic references

1. Skoog, Douglas., Holler F. James., Crouch R. Stanley, 2007. Principles of analytical chemistry.
2. A text-book of volumetric analysis: with special reference to the volumetric processes by W Henry.
3. Scheme and studies of reference materials for volumetric analysis by Toshiaki Asakai

### Supplementary literature

1. <http://www.wiredchemist.com/chemistry/instructional/laboratory-tutorials/volumetric-analysis>
2. [https://www.izito.ws/ws?q=analytical%20chemistry%20lab&asid=iz\\_ws\\_gc4\\_02&mt=b&nw=g&de=c&ap=&ac=974&cid=10380035402&aid=103530108936&kid=kwd-53784333&locale=en\\_US&gclid=EAIAIQobChMIwqiJjtXQ7QIVQhN7Ch3rKgKHEAMYAiAAEgIk8vD\\_BwE](https://www.izito.ws/ws?q=analytical%20chemistry%20lab&asid=iz_ws_gc4_02&mt=b&nw=g&de=c&ap=&ac=974&cid=10380035402&aid=103530108936&kid=kwd-53784333&locale=en_US&gclid=EAIAIQobChMIwqiJjtXQ7QIVQhN7Ch3rKgKHEAMYAiAAEgIk8vD_BwE)



