



King Saud University  
Department of Chemistry

CHEM 451

**Chemical Separation & Chromatographic Methods**

First Semester **2020/2021**



**Credit Hours:** 2 hours (1+2).

**Time:** Lecture: Mon. 01:00–02:00 PM

**Lecture Theater:** Building No. 5 (0140 05 1 A 078).

**Instructor:** Dr. Ahmad Aqel.

**Web Site:** fac.ksu.edu.sa/aifseisi

YouTube Channel: <https://www.youtube.com/user/MrAhmadaqel>

**Office No.:** 2A149 & AA53.

**Office Hours:** Sun, Tue and Thu: 10:00–11:00, Mon and Wed: 11:00–12:00.

**E-mail:** aifseisi@ksu.edu.sa

**Teaching Assistant:** Mr. Ahmad Abdul-Wahab.

**Prerequisites:** CHEM 354.

### **Course Objectives ...**

The main purpose of this course is to help the students to learn and understand several concepts in separation science. By the end of this course, students expected to:

- Understand the principles of separation methods.
- Be familiar with the separation methods concepts.
- Know the proper separation tool for specific compounds.
- Learn how to treat with experimental data.
- Recognize the specific factors influencing the separation techniques.

This course also designed to give students the opportunity to perform and evaluate different separation experiments, to identify and quantify various standard compounds, and to deal with some traditional and modern analytical instruments.

### **Course Description ...**

This course is designed to provide principles and practical experience in separation methods for BSc students. The course consists of one hour lecture and two hours lab per week. Lectures and experiments provide the fundamentals needed to understand the techniques and instrumentations involved in these powerful analytical tools.

### **Textbook & References ...**

- 1- Ibrahim Al-Zamil, "Analytical Chemistry, Instrumental Analysis", 2<sup>nd</sup> Ed., Al-Khrigi Library, 1998 (in Arabic).
- 2- Douglas A. Skoog, James J. Leary, "Principles of Instrumental Analysis", 4<sup>th</sup> Ed., Saunders College Publishing, 1992.
- 3- K. Robards, P.E. Jackson, P.R. Hadad, "Principles and Practice of Modern Chromatographic Methods", Burlington Elsevier Science, 2012.

### **Course Contents (Lecture) ...**

The course includes series of lectures and experiments covers the following subjects:

- Theory of separation methods
- Traditional separation methods
- Instrumental separation methods
- Chromatographic methods
- Applications of chromatography (qualitative and quantitative analysis)
- Analytical performance and method validation.

### **Course Contents (Laboratory) ...**

During this practical course, students will be exposed to traditional and modern techniques for separation and analysis of several standards and real samples. Various extraction and chromatographic techniques such as LLE, SPE, IE, TLC, GC and HPLC will be included. Each experiment consists of general principles, components of the system and applications (qualitative and quantitative analysis).

### **Evaluation & Assessment ...**

Midterm exam .....	20%
Assignment, discussion and homework's .....	10%
Laboratory (reports & quizzes) .....	30%
Final exam (comprehensive) .....	40%

*Good Luck!*