UNIVERSIDAD AUTÓNOMADENUEVO LEÓN
SCHOOL OF MEDICINE
Ba CLINICAL CHEMISTRY

SYNTHETIC PROGRAM.

1.Identification data:	
•Institution	Universidad Autónoma de Nuevo León
•College	Faculty of Medicine
•Education program	Clinical Chemistry
•Learning unit	Fundamentals of analytical chemistry
•Total hours of classroom, theory and practice	140
•Frequency in classroom per week	7 hours
•Total extra hours Outside classroom)	40
•Modality	Schooled
•Academic period	Third semester
•Type of learnigunit	Compulsory
•Curricular area	ACFB
•UANL Credits	6
•Date of elaboration	April 12, 2018
•Date of actualization	January 25, 2024
•Responsible (s) for the design and	M.E.S. Angélica Margarita Romero de León, Dra. Rocío Castro Ríos, Dra. Marsela Garza Tapia

actualization	Amendment: Dra. Rocío Castro Ríos, Dra. Marsela Garza Tapia, Dra. Graciela Granados Guzmán, Dra. Magdalena Escobar Saucedo, QCB

2.Purpose(s):

The learning unit "Fundamentals of Analytical Chemistry" contributes to achieving the graduate profile by developing the necessary competencies to interpret the behavior of biochemically relevant compounds. This will enable students to justify, select, and develop laboratory tests applicable to their professional work.

According to the general competencies, in this learning unit, the student will use logical, formal, and mathematical language to interpret chemical reaction systems involving chemical equilibrium and the factors that affect it. The unit encourages students to commit to environmental care through strategies outlined in theoretical classes and during laboratory practices, such as handling and disposing of chemical waste. Additionally, students will adapt to the conditions and regulations of the learning unit for their work in both theoretical sessions and laboratory work.

In this unit, students apply specific competencies both in theory and practice, solving chemical equilibrium problems in different systems. Laboratory work is conducted following Mexican and international official standards to ensure the proper use and disposal of chemical reagents, thus preserving health and the environment.

The "Fundamentals of Analytical Chemistry" unit is offered in the third semester and is mandatory in the curriculum of the Bachelor’s Degree in Clinical Chemistry. It applies the competencies of nomenclature, chemical reactions, and stoichiometry acquired in General Chemistry. Moreover, the physical and chemical processes of equilibrium are grounded in the thermodynamic principles previously reviewed in Physicochemistry. It also draws on competencies acquired in the Advanced Mathematics unit, such as algebraic equations and the handling of logarithmic functions, to solve chemical equilibrium problems.

The "Fundamentals of Analytical Chemistry" unit is related to other learning units studied in subsequent semesters, such as Applied Analytical Chemistry, Biochemistry, and Instrumental Analysis, as it provides the foundation for the development of chemical analysis.

3. Competence of the graduate profile

- **General skills contributing to this learning unit**

Instrumental skills:

2. To use logical, formal, mathematical, iconic, verbal and non-verbal languages according to their stage of life, to understand, interpret and express ideas, feelings, theories and currents of thought with an ecumenical approach.

Personal and social interaction skills:

10. To intervene in the face of the challenges of contemporary society at the local and global level with a critical attitude and human, academic and professional commitment to contribute to consolidating general well-being and sustainable development.

Integrative skills:

15. To achieve the adaptability required by the uncertain social and professional environments of our time to create better living conditions.

- **Specific skills of the graduate profile that contributes to the learning unit**

1. To solve problems by applying knowledge of the chemical composition of matter as well as its physicochemical properties to determine analytes in biological, environmental and food matrices.
2. To execute physical, chemical and/or biological procedures in the collection, handling, storage and analysis of samples to contribute to a reliable clinical, toxicological, chemical, food, forensic and environmental diagnosis.
3. To handle chemical and biological materials following official Mexican and/or international standards that guarantee their correct use and disposal to preserve health and the environment.

4. Factors to consider for evaluating the learning unit
• Portfolio exercises • Daily evidencies. • Laboratory reports. • Partial exams. • Course integrative project/product
5. Course integrative project/product:
Solving Integral Problems in Analytical Chemistry Using Chemical Equilibrium.
6. Sources of support and consultation (bibliography, hemerography, electronic sources):

Brown, T. L. y Lemay E. H. (2013). Química la Ciencia Central. México: editorial Pearson.

Buttler, J. (1998) Ionic Equilibrium, Solubility and pH calculations. EUA: editorial Wiley Interscience.

Christian, G. (2009) QuímicaAnalítica. México: editorial McGraw Hill Interamericana.

Harris, D.C. (2007) Análisis Químico Cuantitativo. España: editorial Reverté

Sánchez-Batanero, P., Gómez del Río, M. I. (2002) Química Analítica General Volumen I, Equilibrios en disolución y métodos analíticos. España: editorial Síntesis.

Silva, M. y Barbosa, J. (2002) Equilibrios iónicos y sus aplicaciones analíticas. España: editorial Síntesis.

Journal of the Mexican Chemical Society, Sociedad Mexicana de Química, https://www.jmcs.org.mx/index.php/jmcs

Analytical Chemistry, American Chemical Society, https://pubs.acs.org/journal/ancham

AnalyticaChimicaActa, Elsevier, https://www.journals.elsevier.com/analytica-chimica-acta

Talanta, Elsevier, https://www.journals.elsevier.com/talanta

Amigos de la Química, Youtube. https://www.youtube.com/channel/UCTiu0apxEtCGpuLYeI-owkg