UANL
UNIVERSIDAD AUTÓNOMA DE NUEVO LEÓN ®

SYNTHETIC PROGRAM

1. Module identification code.	
Name of the institution:	Universidad Autónoma de Nuevo León
Name of the school:	School of Medicine
Name of the degree program:	Clinical Chemistry
Name of the course (learning unit):	Advanced mathematics
Total number of class hours-theory and practice:	100
Class hours per week:	5 hours
Independent study:	50
Course modality:	Face-to-face instruction
Module level:	First semester
Core/elective module:	Core
Curriculum area:	ACFB
UANL credit points:	3
Create date:	April 17th, 2017
Date of last amendment made:	July 5th, 2023
Person(s) responsible for the design and amendment of the module:	Dr. C Judith Rocha Gámez M.C. Samantha Armijo Martínez Amendment: Dra. C. Magdalena Escobar Saucedo

2. Purpose:

Develop the student's capacity for abstraction and logical thinking to apply commonly used mathematical tools in the fields of chemistry and biology. The mathematical skills acquired in this unit of learning (UL) will be utilized to solve problems related to biochemical analysis during their academic and professional performance.

Regarding the contribution to the development of the university's general competencies, the student will be able to use the learning strategies suggested by the professor for problem-solving and timely decision-making. When working in teams, they demonstrate commitment and respect toward their peers, maintaining a conciliatory attitude toward differing opinions. Furthermore, by participating in class, they assume leadership by being attuned to the needs of their colleagues, contributing coherent ideas for solving presented problems.

As for the contribution to the development of specific competencies, the student acquires the mathematical tools that they will later use to solve problems related to the chemical composition of matter and its physicochemical properties. This unit of learning serves as a foundation for most of the learning units in the educational program. For example, the properties of arithmetic operations, the use of logarithms, scientific notation, and calculations involving derivatives and integrals are employed in the learning units of Physics, Physicochemistry, and Fundamentals of Analytical Chemistry. Likewise, the UL of Fundamentals of Analytical Chemistry, Biochemistry, and Instrumental Analysis utilizes systems of equations and graphical representations to construct calibration curves and create acid-base equilibrium graphs and/or kinetics graphs. In these same learning units and in Microbiology, they apply the concepts of dilutions in the preparation of their reagents and/or samples.

3. Competences of the graduate profile

General competences to which this module (learning unit) contributes:

Instrumental skills:

1. To apply autonomous learning strategies at different levels and fields of knowledge that allow them to make timely and relevant decisions in the personal, academic and professional spheres.

Personal and social interaction skills:

9. To maintain an attitude of commitment and respect towards the diversity of social and cultural practices that reaffirm the principle of integration in the local, national and international context in order to promote environments of peaceful coexistence.

Integrative skills:

13. To assume leadership roles committed to social and professional needs in order to promote relevant social change.

Specific competences of the graduate profile to which this module (learning unit) contributes:

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.

4. Summative evaluation:

- Daily evidences
- Parcial exams
- PIA

5. Course integrative project/product:

Report on Problem Solving in Mathematical Applications in the Area of Physical Chemistry or Biology.

6. References:

Text books

(Swokowski, 2011)Swokowski, (2011). *Álgebra y trigonometría con geometría analítica,* Décimo tercera edición CENGAGE learning

(Brown, 2014) Brown, T. L., LeMay, H. E., Bursten, B. E., & Burdge, J. R. (2014). Química. La ciencia central. México: Pearson.

(Christian, 2009). Christian, G. D. (2009). Química Analítica. México: Mc Graw Hill.

(Giancoli, 2009) Giancoli, D. C. (2009). Física. México: Pearson.

(Goodman, 1996). Goodman, A., & Hirsch, L. (1996). Algebra y Trigonometría con Geometría Analítica. México: Prentice Hall Inc.

(Rees, 2011) Rees, P. K., & Sparks, F. W. (2011). Algebra. México: Reverté

(Zill D. G., 2011) Zill, D. G., & Wright, W. S. (2011). Cálculo. Trascendentes tempranas. México: Mc Graw Hill.

Digital tools:

- Academia Internet. (1 de agosto de 2020) Academia Internet. Tutoriales académicos. Obtenido de Academia internet canal de YouTube: https://www.youtube.com/user/AcademiaInternet/featured
- Facultad de Medicina. (1 de agosto de 2020). Página Facultad de Medicina de la UANL. Obtenido de Facultad de Medicina QCB: http://www.medicina.uanl.mx/pregrado/qcb/
- Facultad de Medicina de la UANL. (1 de agosto de 2020). Plataforma Facultad de Medicina. Obtenido de Página Plataforma Facultad de Medicina: http://www.medicina.uanl.mx/plataforma/
- Khan Academ yEspanol. (1 de agosto de 2020). Khan Academy Espanol.https://www.youtube.com/user/KhanAcademyEspanol/featured
- Math2me. (1 de agosto de 2020). Math2me matemáticas para todos. Obtenido de Math2me canal youtube: https://www.youtube.com/user/asesoriasdematecom/featured
- Ríos Gallego, J. A. (1 de agosto de 2020). Julio Profe Net. Obtenido de Julio Profe Net canal de youtube: https://www.youtube.com/user/julioprofe/featured
- Vitual. (1 de agosto de 2020). VitualTutoriales. Obtenido de Vitual canal de youtube: https://www.youtube.com/user/AlphaMatFis/featured.
- Nearpod: Student Engagement Platform. (1 de agosto de 2020). https://nearpod.com/ • Edpuzzle. (1 de agosto de 2020).https://edpuzzle.com/
- Microsoft Teams. Office 365.