



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

1.- GENERAL INFORMATION

Learning Unit: Analytical Chemistry Lab I		Academic Department: Chemistry		Course Format: Lab	
Prerequisites (P) None	Corequisites (CO) Analytical Chemistry I	Ascribed Academy: Quantitative and Qualitative Analysis		Module: M3: Analysis and characterization.	
Type Basic, and Mandatory	Practice hours 68	Lecture hours 0	Total hours 68	Credits 5	

2.- GENERIC COMPETENCIES

Students ...

- ... express their ideas using chemical language.
- ... analyze situations using basic concepts of analytical chemistry.
- ...express critical judgements based on experience and conceptualization.
- ...research scientific and technological innovations in order to develop and solve problems.
- ...establish relationships between chemistry concepts and their applications.
- ...offer solutions to stated problems through established methods.
- ...utilize information and communication technologies to process and interpret data.



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

3.- SPECIFIC CHARACTERISTICS OF THE COMPETENCY

Knowledge	Students... ...know the essential concepts of physical chemistry, analytical chemistry, and instrumentation. ...understand the chemical reactions involved in analyzing. ...know and are able to handle instruments and basic material in the chemistry laboratory. ...perform good lab practices and know the lab rules. ...know and follow the steps of analysis. ...develop oral and written expression skills by presenting reports of different topics about the subject.
Skills	Students... ...critically analyze the elements that influence their decision-making. ...administer the resources in a way they are aware of the limitations they have to achieve their goals. ...face the challenges and design strategies for their solution. ...apply their knowledge in different fields and establish relationships between this knowledge and their daily life. ...have a constructive attitude that is congruent with the knowledge and skills they have in work teams. ...learn independently. ...relate the acquired knowledge of analytical chemistry with instrumental methods. ...make decisions in order to contribute to the solution of problems. ...follow the safety rules when handling substances, instruments and equipment inside the laboratory. ...work collaboratively, expressing their points of view with an open mind and considering those of the others with a critical approach. ...contrast the results of an investigation or experience against previous hypotheses and communicate their conclusions.



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

Aptitudes	Students ...explore, discriminate, and organize the information of situations or problems that concern their interests or those of their community, offering viable solutions.
Values	Students ...search for the common good and the success of themselves and that of their partners. ...respect and follow the rules. ...assume the consequences of their behavior and decisions. ...are aware of the importance and the good handling of the resources that are available.

4.- TRANSVERSAL COMPETENCIES

- | | |
|-------------------------------------|--|
| ☒ | Foreign Language (English) |
| ☒ | Critical, analytical and synthetic thinking. |
| ☒ | Oral and written expression |
| ☒ | Professional ethics |
| ☐ | Administration of human and material resources |
| ☐ | Leadership and sustainability |
| ☐ | Creativity, innovation and entrepreneurship |
| ☐ | Others |



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

5.- COURSE CONTENT OF THE LEARNING UNIT

The suggested laboratory practices that go along with the content of Analytical Chemistry I are the following:

UNIT I. Introduction to Analytical Chemistry.

- Preparation of samples for chemical analysis. .

UNIT II. Chemical equilibria in aqueous solutions.

- Preparation and assessment of solutions.

UNIT III. Acid-base equilibria

- Titration curves.
- Determination of food acidification.
- Determination of alkalinity in potable water.
- Evaluation of a commercial milk of magnesia.
- Determination of the neutralizing capacity of an antacid tablet.

UNIT IV. Precipitation equilibria.

- Determination of the purity of table salt.
- Determination of chlorides in potable water.

UNIT V. Complex formation equilibria.

- Determination of total hardness of water.
- Determination of lead in a mineral.

UNIT VI. Redox equilibria.



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

- Determination of calcium in an aluminum tube.
- Determination of hydrogen peroxide.
- Determination of organic matter in soils.
- Determination of the bleaching ability of a commercial sample of "chlorine".
- Determination of chrome in leather products.
- Determination of ascorbic acid in tablets.

6.- ASSESSMENT

☒
☐
☐

Numeric grade.

7.- GRADING CRITERIA OF THE LEARNING UNIT

Indicator of evaluation	Percentage
Departmental exam	0
Partial exam	20
Homework	0
Research activities	10
Practice report	40



UNIVERSIDAD DE GUADALAJARA

Centro Universitario de Ciencias Exactas e Ingenierías
Secretaría Académica / Coordinación de la Licenciatura en Química
Comité de Innovación Curricular de la Licenciatura en Química

Class participation	10
Practical test	20

8.- REQUIRED MATERIAL (for students)

- ☒ Calculator
- ☒ Periodic table
- ☒ Lab coat
- ☐ Text book
- ☒ Workbook
- ☒ Other: Safety glasses, logbook, reagent bottles of 500 and 1000 mL, 500 mL wash bottle, pipet bulb, cloth.

COURSE EVIDENCE (Deliverables)

Practice report
Theoretical and practical tests.
Research activities
Problem solutions.

Haga clic aquí para escribir texto.