

Course Syllabi

1. INDU-00023 INSTRUMENTAL ANALYSIS

2. Instructor:

- Silvia Johana Ortiz Ulloa

3. Bibliography

- Análisis Instrumental/ Biblioteca Campus Central/ 543.07 / 110008, Kenneth A. Rubinson, Judith F. Rubinson, 2004
- Química Analítica/ Biblioteca Campus Central / 543/ 108363, Gary D. Christian, 2009
- Química Analítica/ Biblioteca Campus Central / 543/ 251016, Douglas A. Skoog, 2000

4. Specific Course Information

- a. The Instrumental Analysis addresses theoretical and practical aspects of modern chemical analysis techniques. Its study allows the student to make qualitative and quantitative determinations of different analytes in different matrices, acquiring capacities to identify, solve and prevent problems in the area of their professional competence. Future professionals will be able to integrate teams working in the area of analysis in laboratories, research projects, consulting companies, etc. E This subject contributes with the discharge profile to:
1. Perform chemical analyses several operating laboratory equipment, using up-to-date analytical techniques and applying good laboratory practices, to provide reliable analytical results.
 2. Direct physical and chemical analysis laboratories with scientific-technical rigor and safety, to provide reliable analytical results.
 3. Apply the basics of training research, at the exploratory and diagnostic level, in an appropriate way, for the development of experiments, for the search, selection and evaluation of information, preparation of bibliographical essays and academic articles and for the communication of findings.

b. Prerequisites:

- INDU-00045 Analytical chemistry
- INDU-00047 Organic synthesis - industry
- INDU-00027 Science and materials

5. Learning Objectives of the Course

- a. To use the techniques of Instrumental Analysis in qualitative and quantitative determinations of organic and inorganic analytes in diverse matrices, basing the development of applicable methods in research and development. - To apply methods of Ultraviolet-Visible and Infrared Spectroscopy in the quantification of analytes and in the structural determination of organic molecules. - To apply atomic absorption spectroscopy for the quantitative determination of metals. - To develop a peace of mind to integrate theoretical and practical knowledge, at the basic level, of the instrumental technique of Chromatography.

b. Learning Outcomes

1. Analyze the characteristics of electromagnetic radiation and its applications in optical spectroscopy and absorption.
2. Establish the relationship between the absorption and emission of energeticaluminous and the quantification or identification of analytes by uv-vis spectroscopy.
3. Perform quantitative analysis of metals in different matrices, applying theoretical and practical knowledge.
4. Determine the quality of analytical results, applying statistical knowledge.

5. Interpret the different steps of the optimization process of analytical parameters and quantitative chromatographic data.
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7. Determine the quality of analytical results, applying statistical knowledge.
8. Recognize the applicability of the various modern chromatographic chemical analysis techniques and their application in different fields of professional competence
9. Identify functional groups of organic molecules through infrared spectroscopy and apply this technique for quantitative analysis.
10. Establish the relationship between the absorption and emission of energeticaluminous and the quantification or identification of analites by uv-vis spectroscopy.
11. Recognize the applicability of the various modern chromatographic chemical analysis techniques and their application in different fields of professional competence
12. Perform quantitative analysis of metals in different matrices, applying theoretical and practical knowledge.

6. Course Topics

1. Uv-vis absorption spechocy
2. Infrared specroscopy
3. Atomic absorption spechobia
4. Crimatography