

COURSE SYLLABUS 2019-20

Basic information on the course			
Course:	Instrumental Analysis II		
Course code:	50903211	Plan:	Chemistry (Curriculum 2009)
Academic Year:	2019-20	Undergraduate/Graduate:	Bachelor's degree
Degree Year:	3	Type:	Obligatory
Duration:	Second Semester		
TIME DISTRIBUTION ACCORDING TO REGULATIONS			
Credits:	6		
Total time:	150 hours		
USE OF LEARNING PLATFORM:	Support to teaching/learning		

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OTHER IMPORTANT INFORMATION

Content justification

It is known that, in general, a large number of analytical methods present limited selectivity in most of the cases, not showing a proper specificity. For this reason, analytes separation of potential interferences present in the matrix, as well as the separation of analytes between themselves in a sample, is a fundamental step in analytical procedures. There is no doubt that the most commonly used method for carrying out separations is chromatography, with extensive applications in all the science fields, fundamentally in the last forty years, due to the development of new modalities that can achieve an improvement in the characterisation of complex mixtures.

Also, the study of works relative to analytical applications of these techniques contributes to provide a proper view of the scope of these techniques.

Nevertheless, the most important limitation of chromatography is the weak power of identification of mixtures of analytes in the same sample, widely compensated by the chromatographic separation of them. The variety and complexity of real samples, by one hand, and the high requirements of knowledge, as wide as possible, about the composition of samples, are two aspects that promoted the instrumental hybridation, treated in the second descriptor of this course.

On the other hand, it is analysed the role of methods with mathematic and statistic origin and other ones coming from formal logic, in order to transform complex analytical signals and data into information, evaluating the main characteristics of chemiometry.

Courses related in Study Plan

Analytical Chemistry

Pre-required knowledge

It is recommended to have passed the course Instrumental Analysis I

COMPETENCES

Basic and general competences

Basic competences

General competences

Key competences University of Almeria

- Oral and written communication in English

- Capability in the use of technologies of information and communication

Specific competences

RELATIVE TO KNOWLEDGE

Study of instrumental techniques and their applications (E-C16)

Metrology of the chemical processes, including quality management (E-C18)

RELATIVE TO SKILLS AND ABILITIES

Skills about the informatic managing and processing of data and chemical information (E-Q6)

LEARNING OUTCOMES

1. RELATED TO GENERAL COMPETENCES. Developing of works and reports in a clear way, to a wide public, specialised or not specialised. Presentations exposing works (UAL3, UAL5). Being able of planning the preparation of works and time of study for achieve the requested competences (UAL3).
2. RELATED TO SPECIFIC COMPENTENCES. Differentiating, in general way, the main analytical techniques of separation (E-C16). Identifying the implied processes in the chromatographic techniques (E-C16). Knowing the basic instrumentation, design and operation of different chromatographic instruments (E-C16). Deducing parameters of separation and evaluation of the quality in a chromatographic separation (E-C16). Knowing the scope of hybridation of techniques in chromatography (E-C16). Distinguishing capabilities and fields of application for each technique through the study of their applications (E-C16). Knowing the procedure for validation of analytical methods (E-C18). Knowing the procedure for quality control in laboratories (E-C18). Learning of informatic procedures for resolution of practical cases (E-Q6).

COMPETENCY ASSESSMENT

Criteria and assessment tools

The global mark will be resulting of a weighted mark of the different aspects and activities to be integrated in the assessment system according the following indications:

Assistance to classes: It will be evaluated the assistance and active participation in seminars and activities academically conducted. The assistance to practical sessions in reduced groups is mandatory. It is requested a minimum assistance of 80% (maximum 1 fault of assistance, properly justified). It shall be provided indicators of control of such assistance. The passing of the course will be linked to the passing, with a minimal mark of 5 out of 10, of the sessions of reduced groups.

Resolution of exercises, problems and conducted works in working groups: 10% (Competences evaluated: E-Q6, UAL-5).

Works, presentations and expositions carried out by the students: 10% (Competences evaluated: E-q6, UAL-3).

Global evaluation session: It will be evaluated the level of theoretical and practical knowledge reached by the students by a final written test carried out the date established by the Faculty of Experimental

Sciences, for June (required a minimum mark of 5 out of 10): 80% (Competences evaluated: EC-16, EC-18).

Follow-Up Mechanisms

- Assistance and participation in seminars
- Application and access to the virtual classroom
- Presentation of activities in class

Functional diversity / Functional disability.

- Those students with disabilities or special educational needs can get in contact with the Delegation of the Rector for the Functional Diversity (<http://www.ual.es/discapacidad>) to receive the appropriate guidance and advice in order to facilitate their instructional, learning and training processes. Likewise, these students may request the implementation of the necessary and suitable adaptations of content, methodology and evaluation that guarantee equal opportunities in their academic development. The processing of any personal data or aggregated information regarding these aforementioned students, in fully compliance with the GDPR, is strictly confidential. Faculties and academic staff lecturing the course referenced by this guide/document will be in charge of applying the recommended adaptations approved by the Delegation of the Rector for the Functional Diversity, this fact will be, therefore, notified to the School or Faculty as well as to the coordinator of the academic course.

COURSE MATERIALS

Recommended course materials

Basic

Skoog D., Holler J., Crouch S.R.. Principios de análisis instrumental. Thomson Paraninfo. 2009.

Rubinson K.A., Rubinson J.F.. Análisis Instrumental. Prentice Hall. 2000.

Cela R., Lorenzo R. Casais M.C.. Técnicas de separación en Química Analítica. Síntesis. 2002.

Miller J.N., Miller J.C.. Estadística y Quimiometría para Química Analítica. Prentice Hall. 2004.

Ramis Ramos G., Álvarez Coque M.C.. Quimiometría. Síntesis. 2001.

Sergio Petrozzi. Practical Instrumental Analysis - Methods, Quality Assurance and Laboratory Management. Wiley-VCH. 2013.

Complementary

de Hoffmann E., Stroobant V.. Mass Spectrometry: Principles and Applications. Wiley-Interscience. 2007.

Other materials

Couse materials available in UAL's library

Can be accessed the bibliography currently present at the Managing System of the Library in the following link:

<http://almirez.ual.es/search/e?SEARCH=ANALISIS INSTRUMENTAL II>

WEBSITE

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