

Year : 2018/19

## **28956 - Agricultural chemical analysis**

### **Syllabus Information**

<b>Academic Year:</b>	2018/19
<b>Subject:</b>	28956 - Agricultural chemical analysis
<b>Faculty / School:</b>	201 -
<b>Degree:</b>	437 - Degree in Rural and Agri-Food Engineering
<b>ECTS:</b>	6.0
<b>Year:</b>	4
<b>Semester:</b>	Second semester
<b>Subject Type:</b>	Optional
<b>Module:</b>	---

### **General information**

#### **Aims of the course**

#### **Context and importance of this course in the degree**

#### **Recommendations to take this course**

#### **Learning goals**

#### **Competences**

#### **Learning goals**

#### **Importance of learning goals**

#### **Assessment (1st and 2nd call)**

#### **Assessment tasks (description of tasks, marking system and assessment criteria)**

#### **Methodology, learning tasks, syllabus and resources**

#### **Methodological overview**

Since the subject is theoretical / practical, the proposed methodology includes classroom lectures complemented by sessions of laboratory practices, where the student will apply the basic knowledge about the main tools of chemical analysis applied to agricultural samples . The lectures are reinforced with solving sessions of various types of numerical problems or exercises.

For better monitoring of the learning process they will be presented to the student a series of questionnaires or exercises

throughout the semester and will encourage the student to use the tutorial hours. In support it is posted on the Web (Moodle platform) Basic reference materials as the course syllabus, class presentations of theoretical issues, scripts complementary practices or different material.

## Learning tasks

The program that the student is offered to help you achieve the expected results includes the following activities.

1- Theory classes (20 hours) that consist of lectures aimed at students to acquire theoretical knowledge and basic principles of Chemical Analysis. Classes will be held interactively with students, discussing with them the aspects that are more difficult or especially interesting for each topic. "Case studies" that allow students to consolidate the theoretical concepts and establish the applicability of chemical analysis in solving problems agrifood be presented.

2- Classes problems (10 hours) for determination of chemical species in agrifood matrices (soil, water, plants, fertilizers, food) that will be inserted in the calendar as progress is made in the content of the subject to be seeing in classes theoretical.

3- Laboratory practice (30 h). According to academic calendar 15 sessions of two hours each will be made. various practices on soil nutrient determination, water quality parameters, composition of fertilizers, etc., that promote the consolidation of theoretical knowledge must be developed.

4- Tutorials. Attendance at tutorials to clarify any doubts of more individualized students is recommended. In them, the teacher can do a better closer monitoring of student work orientating with the most appropriate methods.

## Syllabus

### Theory Programme

1. Introduction to chemical analysis. Classification of the analytical methods.
2. Stages in chemical analysis.
3. Sampling.
4. Chemical treatment of the samples
5. Calibration methods.
6. Volumetric analysis methods.
7. Instrumental analysis methods. Introduction. Classification.
8. Electro-analytical methods. Conductimetrics and potentiometrics. Applications.
9. Spectroscopic methods.



## Bibliography and recommended resources

- BB** Faithfull, Nigel T.. Métodos [de] análisis químico agrícola : manual práctico / Nigel T. Faithfull ; traducción de Ana Cristina Ferrando Navarro ; revisión de Miguel Ángel Usón Finkenzeller . Zaragoza : Acribia, 2005
- BB** Harris, Daniel C.. Análisis químico cuantitativo / Daniel C. Harris . 3ª ed. Barcelona [etc.] : Reverté, cop. 2007  
 Hernández Hernández, Lucas.
- BB** Introducción al análisis instrumental / Lucas Hernández Hernández y Claudio González Pérez . Barcelona : Ariel, 2002
- BC** Aceites y grasas / PANREAC . Barcelona [etc.] : Montplet & Esteban, 1983
- BC** Aguas / PANREAC . Barcelona [etc.] : Montplet & Esteban, 1983
- BC** Carne y productos cárnicos / PANREAC . Barcelona [etc.] : Montplet & Esteban, 1983
- BC** Cereales, derivados y cerveza / PANREAC . [s.l.] : Montplet & Esteban, 1983
- BC** Hamilton, Leicester F.. Cálculos de química analítica / Leicester F. Hamilton, Stephen G. Simpson, David W. Ellis ; traducción Luis Rodríguez Terán ; revisión técnica José Luis Morales . 2ª ed. México [etc.] : McGraw-Hill, imp.1990
- BC** Jackson, M.L.. Análisis químico de suelos / M.L. Jackson ; traducido del inglés americano por José Beltrán Martínez . [4a. ed.] Barcelona : Omega, 1982
- BC** Leche y productos lácteos / PANREAC . Barcelona [etc.] : Montplet & Esteban, 1983
- BC** Métodos normalizados : para el análisis de aguas potables y residuales / preparado y publicado conjuntamente por American Public Health Association, American Water Works Association, Water Pollution control Federation ; directora de edición Mary Ann H. Franson . Madrid : Díaz de Santos, D.L. 1992
- BC** Métodos oficiales de análisis / [publicados por el] Ministerio de Agricultura, Pesca y Alimentación, Dirección General de Política Alimentaria . Madrid : Secretaría General Técnica, Ministerio de Agricultura, Pesca y Alimentación, 1993-1994
- BC** Pearson, David. Técnicas de laboratorio para el análisis de alimentos / David Pearson ; traducido del inglés por C. Romero, J. L. Miranda y J. L. Suso . [1a ed.],3a reimpr. Zaragoza : Acribia, D.L.

- 1997
- BC** Primo Yufera, Eduardo. Química agrícola. I, Suelos y fertilizantes / E. Primo Yúfera, J.M. Carrasco Dorrién . 1a ed., reimpr. Madrid : Alhambra, 1987
- BC** Productos derivados de la uva y similares / PANREAC . [s.l.] : Montplet & Esteban, 1983
- BC** Rubinson, Judith F.. Química analítica contemporánea / Judith F. Rubinson, Kenneth A. Rubinson ; Traducción, Ma Teresa Aguilar Ortega ; Revisión técnica, Josefina de Gyves Marciniack . 1a ed. México [etc.] : Pearson Educación : Prentice Hall Hispanoamericana, 2000
- BC** Rubinson, Kenneth A.. Análisis instrumental / Kenneth A. Rubinson, Judith F. Rubinson . 1a. ed. en español Madrid : Pearson Educación, cop. 2001
- BC** Skoog, Douglas A.. Fundamentos de química analítica / Douglas A. Skoog, Donald M. West, F. James Holler . 4a. ed. Barcelona [etc.] : Reverté, D.L. 1996-1997
- BC** Skoog, Douglas A.. Química analítica / Douglas A. Skoog...[et al.] ; traducción María del Carmen Ramírez Medeles ; revisión técnica Luz Beatriz Santos Aquino . 7a. ed. México [etc.] : McGraw-Hill, cop. 2000

The updated recommended bibliography can be consulted in:  
<http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=8117>