

27228 - Fast-response Analytical Methods

Información del Plan Docente

Academic Year	2017/18
Faculty / School	100 - Facultad de Ciencias
Degree	452 - Degree in Chemistry
ECTS	5.0
Year	4
Semester	Second semester
Subject Type	Optional
Module	---

1.General information

1.1.Introduction

1.2.Recommendations to take this course

1.3.Context and importance of this course in the degree

1.4.Activities and key dates

2.Learning goals

2.1.Learning goals

2.2.Importance of learning goals

3.Aims of the course and competences

3.1.Aims of the course

3.2.Competences

4.Assessment (1st and 2nd call)

4.1.Assessment tasks (description of tasks, marking system and assessment criteria)

5.Methodology, learning tasks, syllabus and resources

5.1.Methodological overview

5.2.Learning tasks

5.3.Syllabus

Theme 1. Introduction. Definitions. Rapid methods of analysis. Advantages and disadvantages of the MARR. Quality of the analytical signal obtained. Methods of screening: rationale, types, analytical possibilities, mathematical treatment of

27228 - Fast-response Analytical Methods

the results, interpretation of the results. Roc curves. Real examples of rapid response in the world of analytical methods.

Theme 2: Rapid response Analyzers: definitions. Classification. Advantages and disadvantages. Dry chemical (test-kits): definitions, types and possibilities. Strips. Types of strips. Construction. Measurement: colour analysers, optical, electrical, other Analyzers (HGF, NIR). Real examples of rapid response in the world of analytical methods.

Theme 3: Sensors: definitions. Classification: physical, chemical biosensors. Parts of a sensor: elemento of recognition (enzyme, immunosensors, aptamers, biological, other), signal transduction: optical, electroanalytical, other. Factors of quality, applications: Multisensor (electronic nose and tongue), treatment of results (neural networks), intelligent sensors (Smart sensors). Real examples of rapid response in the world of analytical methods.

Theme 4: Remote analysis: definition, characteristics, remote sensing, lasers in remote scanning, x-ray fluorescence spectrometry other analytical methods of rapid response. Real examples of rapid response in the world of analytical methods.

5.4.Course planning and calendar

5.5.Bibliography and recommended resources

- | | |
|-----------|---|
| BB | Analytical method validation and instrument performance verification / edited by Chung Chow Chan ... [et al.] Hoboken (New Jersey) : John Wiley & Sons, cop. 2004 |
| BB | Eggins, Brian R.. Chemical sensors and biosensors / Brian R. Eggins . - [2nd] repr. Chichester : John Wiley and sons, 2004 |
| BB | Kellner, R.. Analytical Chemistry. Wiley-Blackwell . 2004 |
| BC | Cunningham, Alice J.. Introduction to Bioanalytical Sensors. Wiley-Blackwell. 1998 |
| BC | Janata, J.. Principles of chemical sensors . Plenum, c1989 |
| BC | M. Butler, P. Vansek, N. Yamazoe (Eds.). Chemical and Biological Sensors and Analytical Methods II . ElectroChemical Society. 2001 |
| BC | Schmid, R. D.; Scheller, F. (Eds.). Biosensors Applications In Medicine, |

27228 - Fast-response Analytical Methods

Environmental Protection and Process
Control . Wiley-Blackwell . 1989

BC Seiyama, Tetsuro. Chemical Sensor
Technology v. 1. Elsevier Science &
Technology. 1988

BC Shah, Vishu. Handbook of Plastics Testing
and Failure Analysis. Wiley-Interscience
[2007]

BC Valcárcel, Miguel. Automatización y
miniaturización en Química Analítica / M.
Valcárcel, M. S. Cárdenas . - [1a. ed.]
Barcelona [etc.] : Springer, D. L. 2000

BC Verma, Hem Raj. Atomic and Nuclear
Analytical Methods. XRF, Mossbauer,
XPS, NAA and ion-beam spectroscopic
techniques. 1st. Ed. Springer. 2010

BC Wilkinson, Herbert. Screening and Test
Sieving Theory and Practice. Wilkinson
and Wright. 1986