

COURSE SYLLABUS 2019-20

Basic information on the course			
Course:	Liquid chromatography coupled to mass spectrometry laboratory		
Course code:	71101108	Plan:	Master's Degree in Advanced Chemistry Laboratory
Academic Year:	2019-2020	Undergraduate/Graduate:	Official University Master
Degree Year:	1	Type:	Obligatory
Duration:	First semester		

TIME DISTRIBUTION ACCORDING TO REGULATIONS	
Credits:	3
Total time:	75 hours
USE OF LEARNING PLATFORM:	Teaching support

TEACHERS			
Name	Romero González, Roberto		
Departement	Chemistry and Physics Department		
Building	CITE III		
Office	120 (Ground floor)		
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Website	Web de Romero González, Roberto		

OTHER IMPORTANT INFORMATION
Content justification
The students will acquire practical knowledge related to the fundamentals, way of use and applications of liquid chromatography coupled to low resolution mass spectrometry. Several activities will be planned, and the students will use LC-MS instrumentation. Several parameters involved in the chromatographic separation, detection, identification and quantitation of the target compounds will be evaluated.
Courses related in Study Plan
Chromatography; Mass Spectrometry; Gas Chromatography coupled to Mass Spectrometry Laboratory; Metabolomics Laboratory; High Resolution Mass Spectrometry Laboratory; Master's Thesis
Pre-required knowledge
Basic knowledge on liquid chromatography and mass spectrometry. This has been previously thought in other courses of the Master.

COMPETENCES
Basic and general competences
<i>Basic competences</i>

- Making judgements
- Learning skill

General competences

Key competences University of Almeria

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Specific competences

Ability to develop and apply analytical methods based on liquid chromatography coupled with low resolution mass spectrometry

LEARNING OUTCOMES

Students should be able to:

- Know the analytical methodologies based on LC coupled with low resolution mass spectrometry for the determination of organic contaminants.
- Use LC instruments coupled to triple quadrupole analyzers.
- Optimize basic parameters related to the chromatographic separation (LC) and spectrometric determination.
- Develop and validate multiresidue methods applying LC-MS.
- Write standard operational procedures.

COMPETENCY ASSESSMENT

Criteria and assessment tools

The described competences will be evaluated using the following evaluation strategies, including the percentage of one of them in the final mark:

Multiple choice test: 25 % (Competence assessed: Making judgements; Learning skills)

Oral presentation: 30 % (Competence assessed: Making judgments; Learning skills; Specific competence)

Submitted report: 35 % (Competence assessed: Making judgements; Learning skills)

Evaluation of the lab work (*in situ*): 10 % (Competence assessed: Work in a team & Specific competence)

Follow-Up Mechanisms

- One-to-one tutorials
- Assistance and participation in seminars
- Registration and Access to the virtual classroom
- Submission of activities

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

- Robert Ardery. Liquid chromatography-mass spectrometry: an introduction. John Wiley & Sons. 2003.
- Wilfried M. A. Niessen. Liquid-chromatography-mass spectrometry. Taylor and Francis. 2006.
- Wenkui Li, Jie Zhang, Francis L.S. Tse. Handbook of LC-MS bioanalysis: best practices, experimental protocols, and regulations. John Wiley & Sons Inc.. 2013.

Complementary

- Quanyun Alan Xu. Ultra-high performance liquid chromatography and its applications. John Wiley & Sons Inc. 2013.
- Salvatore Fanali, Paul R. Haddad, Colin F. Poole, Marja-Luisa Riekkola. Liquid chromatography. Volume 2, Applications. Elsevier. 2017.
- Salvatore Fanali, Paul R. Haddad, Colin F. Poole, Marja-Luisa Riekkola. Liquid chromatography. Volume 1, Fundamentals and instrumentation. Elsevier. 2017.
- Michal Holcapek, Wm. Craig Byrdwell. Handbook of advanced chromatography/mass spectrometry techniques. Academic Press and AOCS Press. 2017.
- Marvin C. McMaster. LC/MS A practical User's Guide. John Wiley & Sons Inc.. 2005.

Other materials

Couse materials available in UAL's library

The existing bibliography can be consulted in the Managing System of the Library, visiting the next link:

<http://almirez.ual.es/search/x?SEARCH=71101108>

WEBSITE

- <https://www.youtube.com/watch?v=Yykc1Cam-Yo>
Introduction to LC-MS
- <https://www.youtube.com/watch?v=vgmSGKVxbYs>
Practical topics

- <http://www.chromatographyonline.com>
Website including news and articles related to the topic of the course
- <https://www.chromacademy.com/index.html>
Website including presentations and educational texts related to the course.