

## DRUG CHEMISTRY AND ORGANIC MARKERS IN FOOD. TRACEABILITY.

MODULE	CONTENT	YEAR	TERM	CREDITS	TYPE
#8	Chemistry	4	2	6	OPTIONAL
<b>LECTURER(S)</b>			<b>Postal address, telephone nº, e-mail address</b>		
<ul style="list-style-type: none"> <li>• <b>Ana Conejo García</b></li> <li>• <b>Olga Cruz López</b></li> <li>• <b>José Francisco Domínguez Seglar</b></li> <li>• <b>Rosario María Sánchez Martín</b></li> </ul>			Email: <a href="mailto:aconejo@ugr.es">aconejo@ugr.es</a> , <a href="mailto:olgacl@ugr.es">olgacl@ugr.es</a> , <a href="mailto:jfdoming@ugr.es">jfdoming@ugr.es</a> and <a href="mailto:rmsanchez@ugr.es">rmsanchez@ugr.es</a>  ACG: Mo, Tu and Th from 11.30 to 13.30 hours OCL: Tu and Th from 9.30 to 12.30 hours JDS: Mo, Tu and Th from 9.30 to 11.30 hours RSM: Mo, We and Th from 14.30 to 16.30 hours		
<b>DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT</b>					
Food Science and Technology					
<b>PREREQUISITES and/or RECOMMENDATIONS (if necessary)</b>					
Organic Chemistry Chemistry and Biochemistry of Foods Analytical Techniques					
<b>BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)</b>					
Analysis of Drugs and its Metabolites in foods. Chemical Traceability in Food. Organic Markers and identification tools.					
<b>GENERAL AND PARTICULAR ABILITIES</b>					
CT.1, CT.2, CT.3, CT.4, CT.7, CT.8, CT.9, CE.1, CE.3 y CE.7					
<b>OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)</b>					
<ul style="list-style-type: none"> <li>• Learn types of drugs and their metabolites in foods and techniques for their detection and quantification.</li> <li>• Understand the structure and properties of drugs and their metabolites present in food.</li> <li>• Know the chemical techniques to determine and elucidate drug structure and their metabolites in food.</li> </ul>					

- Knowing the scientific method, and skills for isolation and characterization and determination of the physicochemical properties of drugs and their metabolites in food.
- Knowing traceability techniques and organic markers used in food industry.

## DETAILED SUBJECT SYLLABUS

### LECTURES:

- UNIT 1. GENERAL CONCEPTS. Concept of Traceability. Clasification. Origin and types of drugs present in food. Regulations. Organic products. Information Sources.
  - UNIT 2. METABOLISM OF DRUGS IN FOOD. Drug metabolic processes. Reactions in phase I and II. Common metabolites.
  - UNIT 3. POTENTIAL EFFECTS OF DRUG RESIDUES IN FOOD ON HUMAN HEALTH. Allergic reactions. Resistors. Carcinogenesis. Teratogenicity. Other reactions. Risk assessment on the health of drug residues in food.
  - UNIT 4. Methods for detecting drugs in food. Classification. Spectroscopic analysis. Chromatography. Mass spectrometry. Colorimetric analysis.
  - UNIT 5. Antimicrobial and its metabolites: Classification. Structure and mechanism of action. Veterinary medicine. Characterization, analysis and quantification.
  - UNIT 6. Corticosteroids and their metabolites: structure and mechanism of action. Veterinary medicine. Characterization, analysis and quantification.
  - UNIT 7.  $\beta$ -adrenergic and its metabolites: Structure and mechanism of action. Veterinary medicine. Characterization, analysis and quantification.
- UNIT 8. Hormonally active drugs and metabolites: Structure and mechanism of action. Veterinary medicine. Characterization, analysis and quantification.
- UNIT 9. Other drugs often used in foods: Antiparasitics. Anthelmintics. Tranquilizers. Pesticides and pesticides. Structure and mechanism of action. Use in agriculture and veterinary medicine. Characterization, analysis and quantification

### LABORATORY SESSIONS:

Chemical methods for determination of drugs and their metabolites in foods.

### READING

- *Analysis of antibiotic/drug residues in food products of animal origin.* Vipin K. Agarwal. ISBN 0-306-44119-3. (1992).
- *Handbook of Food Analysis, Second Edition. Volume 2: Residues and Other Food Component Analysis* ISBN 978-0824750374. Leo M.L. Nollet (Editor) .(2004).
- *Food authenticity and traceability.* Michèle Lees. ISBN 1-85573-526-1. (2003).
- *Guía para la aplicación del sistema de trazabilidad en la empresa agroalimentaria.* Agencia Española de Seguridad Alimentaria. www.aesa.msc.es.NIPO: 355-04-001-9. (2004).

## ASSESSMENT (INSTRUMENTS, CRITERIA AND FINAL QUALIFICATION PERCENTAGE, ETC.)

Assessment will be based on the exams and students' personal work, which will have to demonstrate the skills acquired.

In the evaluation process the student should show a uniform minimum knowledge of all objectives. Simply not fully aware of the contents part ignoring the

rest. In exceptional cases, it may make additional oral exam to justify a student's knowledge.

It is mandatory to carry out the lab work to pass the course, being indispensable to attend all practice sessions, as well as performing a test that guarantees their knowledge.

Neither theory exams passed, will be saved for the next academic year or for the special examination in September. Approved practices are not saved for the next academic year.

**LINK OF THE RULE OF EVALUATION AND QUALIFICATION OF STUDENTS UGR:**  
<http://farmacia.ugr.es/noticias/docu/NormEVALUACINYCALIFICACIN.pdf>

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LEARNING OUTCOMES	ASSESSMENT	% MARKING
CT1; CT2; CT7; CT8; CE3, CE7	SE.1, SE.2, SE.3 y SE.4	70
CT1; CT2; CT4 CE3, CE7	SE.7, SE.8y SE.10	20
CT1; CT3; CT7; CT8; CE3, CE7	SE5; SE6; SE11; SE12; SE15	10

