SUBJECT GUIDE

Academic year 2016-2017

DRUG CHEMISTRY AND ORGANIC MARKERS IN FOOD. TRACEABILITY.

DATE OF APPROVAL BY THE DEPARTMENT COUNCIL			20-12-2016		
MODULE	**CONTENT**	**YEAR**	**TERM**	**CREDITS**	**TYPE**
#8	Chemistry	4	2	6	OPTIONAL
LECTURER(S)			**Postal address, telephone nº, e-mail address**		
• **Ana Conejo García** • **Olga Cruz López** • **José Francisco Domínguez Seglar** • **Rosario María Sánchez Martín**			Email: aconejo@ugr.es, olgacl@ugr.es, jdfdoming@ugr.es and rmsanchez@ugr.es ACG: Mo, We and Fr from 11.30 to 13.30 hours OCL: Mo, We and Fr from 11.30 to 13.30 hours JDS: Mo, We and Fr from 11.30 to 13.30 hours RSM: Mo, We and Fr from 14.30 to 16.30 hours		
DEGREE WITHIN WHICH THE SUBJECT IS TAUGHT					
Food Science and Technology					

PREREQUISITES and/or RECOMMENDATIONS (if necessary)

Organic Chemistry

Chemistry and Biochemistry of Foods

Analytical Techniques

BRIEF ACCOUNT OF THE SUBJECT PROGRAMME (ACCORDING TO THE DEGREE)

Analysis of Drugs and its Metabolites in foods. Chemical Traceability in Food.
Organic Markers and identification tools.

GENERAL AND PARTICULAR ABILITIES

CT.1, CT.2, CT.3, CT.4, CT.7, CT.8, CT.9, CE.1, CE.3 y CE.7

OBJECTIVES (EXPRESSED IN TERMS OF EXPECTED RESULTS OF THE TEACHING PROGRAMME)

- Learn types of drugs and their metabolites in foods and techniques for their detection and

quantification.
• Understand the structure and properties of drugs and their metabolites present in food.
• Know the chemical techniques to determine and elucidate drug structure and their metabolites in food.
• 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 presnt 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. β-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.)

GENERAL CRITERIA:

1. The evaluation will be based on exams and personal work made by the student along the semester.
2. Evaluation methods will be established by the instructor/instructors of the subject, at the beginning of the academic year and according to the guidelines below (see Tables 1 and 2).
3. During the evaluation process the student must show a minimum and uniform knowledge of all the questions evaluated. Exceptionally, the teacher could ask for an additional and supplementary oral exam to justify the student knowledge.
4. Link to Criteria for Students Evaluation (UGR):
   https://goo.gl/uHfqJy

   Year-long evaluation:
   - Evaluation methods in Table 1 are applicable to year-long evaluation.
   - Students will choose between a final exam or the elaboration, presentation and defense of research homework. In both cases it will be indispensable requirement to obtain a minimum mark of 5 to pass the subject.
   - The final mark of the subject will be calculated according to Table 1 from the marks obtained in the final mandatory exam/homework, the marks in laboratory lessons and class attendance, as well as any other evaluation method that the instructor/instructors had considered at the beginning of the term.
   - The practical lessons are mandatory to pass the subject. The student MUST ATTEND ALL the practical lessons and pass the corresponding exam. Failing to do so, students will need to take and pass practical and theoretical examinations at the extraordinary examination.
   - Calls to the practical lessons must be attended by all substitute students at the date and time specified in the call. Students with improperly justified absence during the call will not be call again.
   - None of the passed exams will be saved for following academic years or for the September exams. Approved practical lessons will not be saved for the next academic year, neither for the special examination in September.

   One-time evaluation:
   - Students can apply for one-time evaluation in case of employment related reasons, health issues, incapacity or any other suitably documented reason that might prevent the compliance of year-long evaluation requirements.
   - Application period for one-time evaluation and application procedure are established by the Criteria for Students Evaluation (see link above).
   - Students under one-time evaluation must pass a theoretical examination and a laboratory practical examination according to what is described in paragraph 3.

   Extraordinary examination:
   - Extraordinary examination will be possible for those students who failed to pass the subject in the ordinary examination (year-long or one-time evaluation modalities).

- Students under extraordinary evaluation must pass a theoretical examination and a laboratory practical examination according to what is described in paragraph 3.

Table 1. Evaluation methods and significance in the final mark.

LEARNING OUTCOMES	EVALUATION	% MARKING
Final exam or final homework	SE.1, SE.2, SE.3, SE.4, SE.5 SE.6, SE.11 and SE12	60-70
Laboratory lessons, field work	SE.7, SE.8, SE.9, SE.10, SE.14 and SE.15	20-30
Class attendance	SE.15	0-10

The values in % of the markings will be set at the beginning of the course by the instructor/instructors of the subject.

Table 2. Codes for the evaluation methods.

EVALUATION METHODS	
SE.1 Long answer written exam	SE.9 Oral examination on laboratory lessons
SE.2 Short answer written exam	SE.10 Elaboration of laboratory notebook
SE.3 Multiple-choice written exam	SE.11 Elaboration of group homeworks
SE.4 Oral exam	SE.12 Elaboration of individual homeworks
SE.5 Exposition of homework	SE.13 Self-assessment
SE.6 Exposition of theory chapters	SE.14 Field tests
SE.7 Practical examination on laboratory lessons	SE.15 Attendance
SE.8 Written examination on laboratory lessons	