

**1. General information****Course:** FOOD TOXICOLOGY**Type:** CORE COURSE**Degree:** 383 - UNDERGRADUATE DEGREE PROGRAMME IN FOOD SCIENCE AND TECHNOLOGY**Center:** 1 - FACULTY OF SCIENCE AND CHEMICAL TECHNOLOGY**Year:** 4**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 58330**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 22**Duration:** First semester**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** MARIA CONSUELO DIAZ-MAROTO HIDALGO - Group(s): 22

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**2. Pre-Requisites**

It is recommended to have previously studied Food Hygiene II

**3. Justification in the curriculum, relation to other subjects and to the profession**

Among the risks to health that foods have, we must consider those that are caused by non-biological agents, some of them produced by chemical substances that contain both plant and animal origin food, such as poisonings produced by biotoxins. Other produced by environmental pollutants that through water, soil or air pass to food as pollutants from industrial waste or pesticides. In some cases these pollutants are produced during the processing of food by chemical reactions induced by heat, or are added fraudulently by man for certain purposes such as anabolic or antibiotics. In any case, they cause a problem for food security that requires institutional control based on compliance with legislation, the performance of certain analytics and the implementation of adequate prevention systems, through protection agencies such as the Food Security Agency and quality certificates

**4. Degree competences achieved in this course****Course competences**

Code	Description
E14	To know knowledge on microbiology and parasitology and food toxicology
E17	To know abiotic contaminants that affect foods, evaluation methods and prevention guidelines.
G07	To possess ability of organization and planning, initiative, entrepreneurship and aptitude to be employed in teamworks. To possess capacity of resolution of specific problems of the professional area and to develop the critical reasoning and decision making.

**5. Objectives or Learning Outcomes****Course learning outcomes****Description**

To manage to promote his aptitudes of leadership and management of teamwork.

To acquire the necessary knowledge to guarantee the food safety of the food and the fulfillment of the procedure of food hygiene in the industry, markets and catering.

To have basic knowledge of food toxicology and methods of toxicological analysis.

To learn the management of the basic and advanced technologies and procedures in the microbiological laboratory and toxicological analysis of food, as well as and to be able to interpret the obtained results.

To acquire the necessary knowledge to guarantee the food safety of the food and the fulfillment of the procedure of food hygiene in the industry, markets and catering.

To manage to promote his aptitudes of leadership and management of teamwork.

To develop his capacity to search information and its synthesis both individually and in a teamwork.

To know the principal abiotic contaminants as well as his origin and prevention.

**6. Units / Contents****Unit 1: Principles of Toxicology****Unit 2: Stages of the toxic response. The biotransformation.****Unit 3: The chemical-toxicological analysis. Test methods****Unit 4: Risk assessment. Food safety.****Unit 5: Natural toxic substances in foods of animal origin**

Unit 6: Natural toxic substances in foods of plant origin

Unit 7: Fungal toxins present in foods I.

Unit 8: Fungal toxins present in foods II

Unit 9: Contaminants from industrial waste. Chlorinated hydrocarbons.

Unit 10: Contaminants from industrial waste. Heavy metals

Unit 11: Toxic substances formed during the processing of food. Polycyclic aromatic hydrocarbons (PAHs).

Unit 12: Toxic substances formed during the processing of food. Products of the Maillard reaction.

Unit 13: Residues of pesticides in food

Unit 14: Residues of drugs for veterinary use in food

Unit 15: Contaminants from food packaging

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures		1.2	30	Y	N	
Laboratory practice or sessions [ON-SITE]	Practical or hands-on activities		0.8	20	Y	Y	
Workshops or seminars [ON-SITE]	Workshops and Seminars		0.2	5	Y	N	
Problem solving and/or case studies [ON-SITE]			0.06	1.5	Y	N	
Final test [ON-SITE]	Assessment tests		0.14	3.5	Y	Y	
Writing of reports or projects [OFF-SITE]			0.7	17.5	N	-	
Practicum and practical activities report writing or preparation [OFF-SITE]	Group Work		0.6	15	N	-	
Study and Exam Preparation [OFF-SITE]	Workshops and Seminars		2.3	57.5	N	-	
<b>Total:</b>			<b>6</b>	<b>150</b>			
<b>Total credits of in-class work: 2.4</b>			<b>Total class time hours: 60</b>				
<b>Total credits of out of class work: 3.6</b>			<b>Total hours of out of class work: 90</b>				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System			
Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Progress Tests	30.00%	30.00%	Practical activities and theoretical knowledge will be evaluated through questionnaires or practical exercises
Theoretical exam	70.00%	70.00%	A final exam will be conducted to assess the practical, theoretical and competencies acquired in the subject
<b>Total:</b>	<b>100.00%</b>	<b>100.00%</b>	

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

#### Evaluation criteria for the final exam:

##### Continuous assessment:

The final note will be weighted according to the percentages indicated above.

##### Non-continuous evaluation:

The final note will be weighted according to the percentages indicated above. In the case of not being able to take all the continuous assessment tests, an additional section may be taken in the final exam.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Bello Gutiérrez, José	Fundamentos de ciencia toxicológica	Díaz de Santos		84-7978-472-5	2001	
Calvo, M y Mendoza, E	Toxicología de los alimentos	Mc Graw Hill		9786071507471	2012	
Camean y Gepeto	Toxicología de los alimentos	Díaz de Santos	Madrid	978-84-7978-727-1	2006	
HUI, Y.H., GORHAM, J.R., MURRELL, K.D. y CLIVER, O.	Foodborne disease handbook	Marcel Dekker	New York		2001	
Hobbs, Betty C.	Higiene y toxicología de los alimentos	Acribia		84-200-0838-9	1997	

Lindner, Ernst	Toxicología de los alimentos	Acribia	84-200-0776-5	1994
Shibamoto, Takayuki	Introducción a la toxicología de los alimentos	Acribia	84-200-0822-2	1996