Annex 6

DISCIPLINE DESCRIPTION

1. Information on the study programme

1.1 Academic institution	**UNIVERSITY OF ORADEA**
1.2 Faculty	**FACULTY OF ENVIRONMENTAL PROTECTION**
1.3 Department	**ENGINEERING OF FOOD PRODUCTS**
1.4 Field of study	**CONTROL AND EXPERTISE OF FOOD PRODUCTS**
1.5 Cycle of study	**BACHELOR**
1.6 Study programme/Qualification	**CONTROL AND EXPERTISE OF FOOD PRODUCTS / ENGINEER**

2. Information on the discipline

2.1 Name of discipline				**INORGANIC AND ORGANIC RESIDUES IN FOOD PRODUCTS**			
2.2 Course holder				Senior Lecturer Eng. Adriana Chiș, PhD			
2.3 Seminar/Laboratory/Project holder				Senior Lecturer Eng. Adriana Chiș, PhD			
2.4 Year of study	I	2.5 Semester	II	2.6 Type of evaluation	Exam	2.7 Regime of discipline	C

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	3	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	1
3.4 Total hours in the curriculum	42	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	14

Time allotment	hours
Study assisted by manual, course support, bibliography and notes	20
Additional documentation in the library/ on specialised electronic platforms and in the field	10
Preparation of seminars/laboratories/ topics/reports, portfolios and essays	10
Tutorship	4
Examinations	2
Other activities: documentation on laboratory optical and chromatographically techniques in food laboratory in Bihor County	8
3.7 Total hours of individual study	**54**
3.9 Total hours per semester	**96**
3.10 Number of credits	**4**

4. Prerequisites (where appropriate)

4.1 curriculum	Chemistry and physics exams passed.
4.2 competences	Fundamental knowledge of general chemistry, inorganic and organic, chemical composition and analysis of foods, physics, the use of Microsoft Office basic programs

5. Conditions (where appropriate)

5.1. related to course	Projector, screen, internet connection
5.2. related to laboratory	Laboratory devices and chemical reagents used for experiments in accord with discipline curriculum

6. Specific competences acquired	
Professional competences	C.3.4 The assessment of the features, performances and limits of a monitoring and automation system in the field of food industry C4.2 The explanation and interpretation of the concepts, methods and models used in the control of food products, using basic knowledge regarding the chemistry of compounds that determine the quality of food products, the transformations they suffer during processing, transport and storage and the determination methods of these compounds. C5.1. Description and use of concepts, theories and basic methods used in the quality control and expertise of food products, regarding the chemistry of the compounds that determine the quality and traceability of food products, the transformations they suffer during processing, transport and storage, the devices and methods of analysis and determination of these compounds and the legislation in the field. C5.4. Assessment of the characteristics, performances and limits of methods and devices used in the field of the analyses and quality control, as well as the expertise of food products

7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	• High qualified specialist in food control field training.
7.2 Specific objectives	• Acquiring by the students of knowledge related to food pollution by chemical substances originated from environment, row materials or due to industrial/home processing • Acquiring by the students of practical methods related to chemical residues isolation and determination from foods

8. Content*/

8.1 Course	Methods of teaching	No. of hours/Remarks
Introduction, types, classification of chemical residues from foods	Interactive lecture and PowerPoint presentation	2
Quantification of chemical residues presence in foods		2
Sources ant paths of chemical contamination of foods by environmental factors		2
Water quality for food industry Water pollution and purification in food industry		2
Chemical residues from natural sources Legal requirements		2
Inorganic chemical residues in foods: Legal requirements 1 - Nitrites and nitrates		2
2 – Heavy metals Hg, Pb, Cd, Sn, As		4
Organic chemical residues in foods: Legal requirements 1- Dioxins and PCBs (Polychlorinated biphenols and furans)		2
2 - Pesticides		2
Chemical residues from technological sources: Legal requirements 1 - N - nitroso - compounds;		2
2 – PAH (Polycyclic aromatic hydrocarbons), 3 MCDP (3-monochlorpropane-1,2 diol)		2
3 – Acrylamide and Melamine		2
Chemical residues from food contact materials Legal requirements		2
Bibliography 1. Alexa, Ersilia, 2003, Contaminanţi în produse vegetale, Ed. Eurobit, Timişoara 2. Banu C-tin, 1982, Produse alimentare şi inocuitatea lor, Editura Tehnică Bucureşti,		

3. Banu C-tin,2008, Suveranitate, securitate şi siguranţă alimentară, Editura ASAB
4. Banu C-tin, 2009, Tratat de industrie alimentară, Editura ASAB
5. Chiş Adriana, 2009, Elemente de toxicologie alimentară – Contaminanţi chimici, Ed. Universităţii din Oradea
6. Chiş Adriana, 2009, Toxicologia mediului – Noţiuni teoretice şi practice, Ed. Universităţii din Oradea
7. Chiș Adriana, 2021, Reziduuri organice și anorganice în produse alimentare, Curs de uz intern
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10. Jianu I., Alexa Ersilia, 1998, Cromatografia în strat subţire în analiza şi controlul produselor agroalimentare, Editura Eurobit, Timişoara
11. Mănescu S. (sub redacţia), 1985 – Tratat de igiena, Vol II, Editura Medicală Bucureşti
12. Savu C-tin, Georgescu Narcisa, 2004 – Siguranţa alimentelor, Editura Semne Bucureşti
13. *** Colecţia de standarde – industria alimentară
14. *** Legis – program informatic referitor la legislatia din Romania
15. *** www.codexalimentarius.net
16. *** w.w.w.efsa.europa.eu

	Methods of teaching	No. of hours/ Remarks
8.3 Laboratory	Practical applications	
Work protection in chemical residues laboratory		1
Analytical methods used for chemical residues in foods		1
Drinkable Water quality indicators; Water anions and cations with toxic potential determination by rapid spectrophotometry		2
Waste water from food industry quality indicators Solved oxygen as indicator of organic residues presence (Winkler method); Oxygen deficiency; BOD (Biochemical Oxygen Demand)5		2
Chemical oxygen demand COD-Mn (Chemical Oxygen Demand by $KMnO_4$)		2
Nitrites and nitrates from vegetal and animal origin food ***1*** **–** Deproteinated extracts getting		2
2 – Calibration curves and samples handling		2
Paper presentation		2

Bibliography

1. Alexa, Ersilia, 2003, Contaminanţi în produse vegetale, Ed. Eurobit, Timişoara
2. Ana, Alex. C. 2002, Manual de lucrari practice in oenologie, Galati: Editura Fundatiei Universitare "Dunarea de Jos" Galati
3. Beresiu, I. 1976, Cultura mazării şi producerea conservelor de mazăre, Bucuresti: Ed.Ceres, Bucureşti
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5. Chircan, I., Toporan, Daniela, 2005, Indrumator pentru lucrari practice în industria cărnii şi a peştelui, Ed. Sitech, Craiova
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13. ***Îndrumătoarele de laborator de la desciplinele de control aferente planului de învăţământ aflate în

biblioteca Facultăţii de protecţia Mediului
14. ***Colecţia de standarde - industria alimentară şi calitatea apei
15. *** LEGIS – program informatic referitor la legislatia din Romania
16. *** www.codexalimentarius.net

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

- The students will acquire knowledge related to chemical substances that can contaminate water and foods, including the contamination pathsways and ways of avoiding contamination and the European legal requirements in the field.

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	Test answer and problem solving	Write test – 8 questions and an application referring on residues MRL	60%
10.6 Laboratory	• Execution and calculation of practical determinations • Elaboration and sustain of the paper	Global evaluation • Continuous evaluation based on laboratory practical activities • Presentation of a paper referring to a chemical residue in foods or drinkable and waste water	10% 30%
10.8 Minimum standard of performance: minimum 5 questions of the test and minimum 5 grade in laboratory activities			

Date of completion

28.03.2015 .

Signature of course holder**

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Signature of seminar/ laboratory **

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Date of approval in the department
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Signature of the Head of Department

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** - Name, first name, academic degree and contact details (e-mail, web page, etc) will be specified