



No _____ from _____

Form code USAMV–CN-0706010102

SUBJECT OUTLINE

1. Information on the programme

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary-Medicine Cluj-Napoca
1.2. Faculty	Food Science and Technology
1.3. Department	Food Science
1.4. Study field	Food Science
1.5. Level field ¹⁾	Master
1.6. Specialization/ Study Program	Food Safety and Consumer Protection (SAPCO)
1.7. Form of education	Full time

2. Information on the discipline

2.1. Name of the course	Chemical contaminants and food safety							
2.2. Course leader	Prof. dr. Maria Tofană							
2.3. Coordinator of seminary/laboratory activity/project	Lect. Dr. Biriș-Dorhoi Elena-Suzana							
2.4. Year of study	I	2.5. Semester	I	2.6. Type of evaluation	Continue	2.7. Course regime	Content ²	DD
							Level of compulsory ³	DI

3. Total estimated time (teaching hours per semester)

3.1. Number of hours/week – frequency form	4	of which: 3.2. course	2	3.3. seminary/ laboratory/ project	2
3.4. Total hours in the curricula	56	of which: 3.5. course	28	3.6. seminary/laboratory	28
Distribution of time					Hours
3.4.1. Study based on handbook, notes, bibliography					34
3.4.2. Extra documentation in the library, on specific electronic platforms and on field					30
3.4.3. Preparation of seminars/ laboratories/ projects, themes, papers, portfolios and essays					35
3.4.4. Tutorial					5
3.4.5. Examination					15
3.4.6. Other activities					0
3.7. Total hours of individual study	119				
3.8. Total hours per semester	175				
3.9. Number of ECTS ⁴	7				

4. Prerequisites (if applicable)

4.1. of curriculum	Food quality control and safety, Food quality management, Agri-food legislation, Food chemistry, Biochemistry, Food microbiology, Toxicology, Food preservation methods.
4.2. of competences	The student must have knowledge about food chemistry, food microbiology, food additives, principles and methods of food preservation, food technologies.

5. Conditions (if applicable)

5.1. of course development	Development of the topic proposed in the analytical program and interactive discussions based on previously announced materials and bibliography and materials presented on the video projector
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5.2. of seminary/laboratory/ project development	Students prepare reports, case studies, data interpretations on themes established in the program of laboratory work
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6. Specific competences acquired

Professional competences	C4.1. Identification and use of scientific research methods in the field of agri-food sciences C 4.2. An integrated approach to food science and technology from a social, economic, ethical and cultural point of view C4.3. Use of evaluation criteria and methods for optimizing agri-food processes C4.4 Use of evaluation criteria and methods for optimizing agri-food processes C4.5 Elaboration of research projects / studies specific to food science and technology
Transversal competences	CT1 Realization of complex, interdisciplinary, individual projects. Demonstrate the ability to apply strategies of perseverance, rigor, efficiency and responsibility at work, punctuality and responsibility for the results of personal activity, creativity, common sense, analytical and critical thinking, problem solving, etc., based on principles, norms and the values of the code of professional ethics in the food field. To be able to think scientific activities by applying interrelation techniques within a team; amplifying and refining the empathic capacities of interpersonal communication and assuming specific attributions in carrying out the group activity in order to treat / resolve individual / group conflicts, as well as the optimal time management. To demonstrate concern regarding the improvement and efficient use of various learning ways and techniques - training for the acquisition of information from bibliographic and electronic databases, both in Romanian and in an international language, as well as the evaluation of the necessity and usefulness of motivations extrinsic and intrinsic aspects of continuing education. CT2 Realization of complex, interdisciplinary projects, with the coordination of a team.

7. Subject objectives (as a result of the specific acquired competences)

7.1. Subject general objectives	To acquire the knowledge regarding the classes of chemical contaminants, methodologies for determining the contaminants according to the national and European legislation.
7.2. Specific objectives	To understand / know the specific language for the discipline Food contaminants and food safety To know the classes of food contaminants and food residues as well as the notions related to food safety in relation to food contaminants To adopt the legislation on food contaminants at national and European level To acquire skills in the analysis of chemical contaminants To know the methods of sampling in the analysis of contaminants.

8. Contents

8.1.COURSE Number of hours – 28	Teaching methods	Notes (1 lecture = 2 hours)
Contamination of food with toxins from molds - Mycotoxins - o Mycotoxins with carcinogenic capacity - o Mycotoxins producing food poisoning - o Inactivation of ochratoxin and other mycotoxins in cereals - o European regulations on presence and control mycotoxins in food	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	4 lectures
2. Contamination of food products with dioxins and PCBs - o Milk dioxin - o PCB in food and feed - a PCB in fish from the North Sea		2 lectures



o European regulations on the presence of dioxins and PCBs in food 3. Pesticide residues in food o Risk of pesticide accumulation o Biopesticides o International trade with pesticides o National and European programs on monitoring the presence of pesticides in food o National and European regulations on the presence and determination of pesticide residues in foodstuffs 4. Residues of veterinary medicinal products in foodstuffs o Aspects of drug use in the food and animal husbandry industry o National and European legislation on the presence and determination of drug residues in foodstuffs		4 lectures 4 lectures
8.2. PRACTICAL WORK Number of hours – 28 Evaluation of chemical contaminants in food and methods of sampling and preparation for analysis: 1. Determination of mycotoxins (aflatoxins, ochratoxins, patulin, etc.) in food (cereals, milk, meat, coffee, wine) by chromatographic methods (HPLC, GC) using different purification systems - monographic evaluation of mycotoxins; - evaluation of the national and European legislation regarding the presence of mycotoxins in food products; - sampling and preliminary preparation of samples for analysis; 2. Case studies. Monitoring chemical risks at FFST Pilot Stations (For meat products, dairy products, wine and beer) -Case study: Evaluation of national and european legislation regarding the presence of contaminants in the assortment of products from FFST Pilot Stations -Case study: determination of contaminants: taking an preparing samples for determination; qualitativer and quantitative analysis fo contaminants present	Conversation, argumentation, debate Debate, algorithmic, case study, heuristic conversation Learning by discovery, debate, case study, conversation, argumentation	1 lab work (2 hours / work) 7 labs (14 h) 7 labs (14 h)
<i>Compulsory Bibliography:</i> 1. Tofana Maria, 2011, Contaminanti alimentari – Performante analitice si reglementari legislative, Ed. Mega, Cluj-Napoca. 2. *** SR EN ISO/CEI 17025/2005, cerinte generale pentru competenta laboratoarelor de incercari si etalonari; 3. Stanciuc, N., G. Rapeanu, 2009, Managementul Sigurantei alimentelor, Ed. Academica, Galati; 4. Banu, C., N. Preda, S.S. Vasu, 1982, Produsele alimentare si inocuitatea lor, ed. Tehnica Bucuresti. 5. Ancuța M. Rotar, Sorin Apostu 2009 – Boli transmisibile prin alimente la om, Ed Risoprint Cluj-Napoca 6. Zoonoze (2004) - Ed Oxford, Palmer		
<i>Facultative Bibliography:</i> 1. Dunne C, M. M., Smyth M (1993). "Multimycotoxin Detection and Clean-up for Aflatoxins, Ochratoxin and Zearalenone in Animal Feed Ingredients using High Performance Liquid chromatography and Gel permeation Chromatography." Journal of Chromatography 629: 229-235. 2. Melotte, L. (2004). "Survey on the Analysis of Mycotoxins." J. Inst. Brew. 110(3): 235-239.		

3. *** EFSA (2004). "Opinion of the Scientific Panel on Contaminants in the Food Chain related to Aflatoxin B₁ as undesirable substance in animal feed." The EFSA Journal **39**: 1-27.
4. *** EFSA (2004). "Opinion of the Scientific Panel on Contaminants in Food Chain on a request from the Commission related to ochratoxin A (OTA) as undesirable substance in animal feed." The EFSA Journal **101**: 1-36.
5. Community Strategy for Dioxins, Furans and Polychlorinated Biphenyls.
6. *** Quality and Accreditation Standards and Guides in Analytical Laboratories: Overview. **2004**.
7. *** Europeennes, C. (2003). "Directive 2003/78/CE de la Commission du 11 aout 2003 portant fixation de prelevement d'echantillons et des methodes d'analyse pour le controle officiel des teneurs en patuline des denrees alimentaires." Journal officiel des Communautes europeennes: L 203/40 - L 203/44.
8. James B. Kaper, Alison D. O'Brien ASM Press Escherichia Coli 0157:H7 and Other Shiga Toxin-producing E. Coli Strains
9. Michael Hügler, Karin Böckle, Ingrid Eberhagen, Karin Thelen, Claudia Beimfohr and Beate Hamsch **2012** Detection and Quantification of E. coli and Coliform Bacteria in Water Samples with a New Method Based on Fluorescence In Situ Hybridisation,
10. Dana Philpott, Frank Ebel (2003) E. coli: Shiga Toxin Methods and Protocols
11. SR ISO 16649-2/2007- Microbiologia alimentelor și nutrețurilor. Metoda orizontală pentru enumerarea Escherichia coli pozitivă la β-glucuronidază. Patrea 2: Tehnica de numărare a coloniilor la 44°C folosind 5-bromo-4-chloro-3-indolyl β-D-glucuronat

9. Correlations between the subject against the expectations of the epistemic community representatives, of the professional associations and employers' representatives in the domain

In order to identify ways to modernize and continuously improve teaching and course content with the most current topics and practical issues, teachers participate in various workshops (with guests from the economic environment), trade fairs of agriculture and food industry (eg AGRARIA), food festivals (eg "Food Festival" - exhibition of products made by students in their final years to support the diploma project) and meetings of professional associations (eg Association of Food Industry Specialists in Romania - ASIAR) where they meet with teachers from various universities, engineers and managers from the economic environment, being debated current and perspective aspects of food production in Romania and Europe.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. Course	Knowledge of the classes of chemical contaminants Knowledge of food safety legislation with reference to chemical contaminants	Continuous evaluation	70%
10.5. Seminary/Laboratory	Knowledge of sampling methods and analysis of chemical food contaminants	Project presentation	30%
10.6. Minimal standard of performance			
Mastery of scientific information transmitted through lectures and seminars at an acceptable level; Obtaining the passing grade for the tests is a condition of passability; Attendance at seminar activities (minimum 80%). Elaboration of the dissertation paper of grade min.6			

¹ Level of study- to be chosen one of the following - Bachelor/Post graduate/Doctoral

² Course regime (content) – for bachelor level it will be chosen one of the following - **DF** (fundamental subject), **DD** (subject in the domain), **DS** (specific subject), **DC** (complementary subject).

³ Course regime (compulsory level) - to be chosen one of the following - **DI** (compulsory subject), **DO** (optional subject), **DFac** (facultative subject)

⁴ One ECTS is equivalent with 25-30 de hours of study (didactical and individual study).



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Filled in on
08.09.2021

Course coordinator
Prof. dr. Maria Tofană

Laboratory work/seminar coordinator
Lect. Dr. Biriș-Dorhoi Elena-Suzana

Subject coordinator
Prof. dr. Maria Tofană

Approved by the
Department on
22.09.2021

Head of the Department
Prof. dr. Ramona Suharoschi

Approved by the Faculty
Council on
28.09.2021

Dean
Prof. dr. Elena Mudura