UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No_____from _____ **Form code USAMV–CN-0706020102**

COURSE DESCRIPTION

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 Engineering**
1.5. Level field[1)]	**Master**
1.6. Specialization/ Study Program	**Food safety and consumer protection**
1.7. Form of education	IF

2. Information on the discipline

2.1. Name of the course	**Quality management of control laboratories and validation of methods**							
2.2. Course leader	**Associate. PhD Crina Carmen Mureşan Lecturer dr. Liana Claudia Salanţă**							
2.3. Coordinator of seminary/laboratory activity/project	**Associate. PhD Crina Carmen Mureşan Lecturer dr. Liana Claudia Salanţă**							
2.4. Year of study	**II**	2.5. Semester	**I**	2.6. Type of evaluation	Summative assessment E	2.7. Course regime	Content[2]	DS
							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					40
3.4.2. Extra documentation in the library, on specific electronic platforms and on field					33
3.4.3. Preparation of seminaries/ laboratories/ projects, themes, papers, portfolies and essays					26
3.4.4.Tutorial					10
3.4.5. Examination					10
3.4.6. Other activities					
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
5.2. of seminary/laboratory/ project development	PPT Presentations and visits to specialized units Students prepare reports, case studies, data interpretations on themes established in the program of laboratory work

6. Specific competences acquired

Professional competences	C2.1 Identification and application of scientific research methods in the field of agri-food sciences C2.2 Analysis and validation of steps for validation of analysis methods according to ISO17025 / ISO 22000 C2.3 Use of modern equipment for evaluation and analysis of food quality and safety C2.4 Use of the most modern techniques, standards and evaluation and analysis criteria for food quality and safety, authenticity and traceability of food C2.5 Development, implementation, optimization and validation of new control methods and techniques on food quality and safety in testing laboratories and agri-food units
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 analytical methods for determining the contaminants and their validation within the official control laboratories
7.2. Specific objectives	Understand / know the vocabulary and terminology specific to the discipline Food contaminants and food safety To know the principles of validation of analytical methods To acquire practical skills for determining food contaminants in the laboratory To learn how to determine the performance parameters of the analytical methods used in the official control of residues and contaminants for different food matrices00

8. Contents

8.1.COURSE **Number of hours – 28**	Methods of teaching	Observations

1. Requirements for quality management in a control laboratory according to SR EN ISO 17025		3 lectures
2. Documents of the quality management system in a control laboratory		3 lectures
3. SR EN ISO 9001 : SR EN ISO 17025	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	2 lectures
4. Audit of the quality management system in a control laboratory - preparation, documentation, development, audit techniques, audit report, post-audit activities	Lecture, PPT Presentations	6 lectures
5. Validation of analytical methods used in the analysis of food contaminants - Methods recommended by CODEX Alimentarius - Factors that may affect the quality of results - Validation criteria for method performance - Method performance parameters		5 lectures
6. Analytical methodologies used in determining pesticide residues - Multi-residue methods (ECOCHEM) for the determination of pesticides by GC-MS		3 lectures
7. Analytical methodologies used in the analysis of Mycotoxins - determination of Ochratoxin A by HPLC		3 lectures
8. Analytical methodologies used in the analysis of other food contaminants		3 lectures

8.2. PRACTICAL WORK **Number of hours – 28**		
1.Case studies on quality management system documents in a control laboratory.	Conversation, debate, algorithmic, case study, learning by discovery, argumentation	6 lectures
2. Case studies on the preparation of an audit report in control laboratories, on different requirements SR EN ISO 17025.		6 lectures
3. Working visit to an external factory laboratory.		2 lectures
4 Case Study: Validation of a method for determining a food contaminant:		2 lecture
Evaluation of performance parameters		2 lecture
Determining the Detection Limit		2 lecture
Determination of the limit of quantification		5 lecture
Determining the measurement uncertainty		3 lecture
5. Determining the Recovery Coefficient		

Compulsory Bibliography:

1. Muresan Crina, 2021, susport de curs
2. Apostu S.(2009) Managementul calitaţii totale, Editura Risoprint Cluj-Napoca
3. Muresan Crina, Marc Romina, 2021, Siguranța alimentelor-trecut si prezent, Editura Risoprint Cluj-Napoca
4. Tofana Maria, 2011, Contaminanti alimentari – Performante analitice si reglementari legislative, Ed. Mega, Cluj-Napoca.
5. *** SR EN ISO/CEI 17025/2005, cerinte generale pentru competenta laboratoarelor d eincercari si etalonari;
6. Stanciuc, N., G. Rapeanu, 2009, Managementul Sigurantei alimentelor, Ed. Academica, Galati;
7. Banu, C., N. Preda, S.S. Vasu, 1982, Produsele alimentare si inocuitatea lor, ed. Tehnica Bucuresti.

Facultative Bibliography:

1. P.A. Luning, W.J. Marcelis, W.M.F. Jongen, (2008) – Managementul calităţii alimentelor o abordare tehno-managerială, Editura Casa Cărţii de Ştiinţă, Cluj-Napoca

2. 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.
3. Jaimez J., Fente CA, Vazquez BI, Franco CM, Cepeda A, Mahuzier G, Prognon P (2000). Journal of Chromatography A, 882, 1-10.
4. Melotte, L. (2004). "Survey on the Analysis of Mycotoxins." J. Inst. Brew. 110(3): 235-239.
5. USDA (1999). Grain Fungal Disease and Mycotoxin Reference, GIPSA Technical Services Division Kansas City, MO.
6. Scudamore KA, Nawaz S, Hetmanski MT (1998). Mycotoxins in Ingredients of Animal Feeding Stuffs:II: Determination of Mycotoxins in Maize and Maize products, Food Additives and Contaminants, 15,1, 30-55.
7. Reif K, Metzger W (1995). Determination of aflatoxins in medicinal herbs and plant extracts; Journal of Chromatography A, 692, 131-136 (1995)
8. *** EFSA (2004). "Opinion of the Scientific Panel on Contaminants in the Food Chain on a request fromthe Commission related to Zearalenone as undesirable substance in animal feed." The EFSA Journal 89: 1-35.
9. *** EFSA (2004). "Opinion of the Scientific Panel on Contaminants in the Food Chain on a request from the Commission related to Zearalenone as undesirable substance in animal feed." The EFSA Journal 89: 1-35.
10. *** EFSA (2004). "Opinion of the Scientific Panel on Contaminants in the Food Chain related to AflatoxinB1 as undesirable substance in animal feed." The EFSA Journal 39: 1-27.
11. *** EFSA (2004). "Oppinion of the Scientific Panel on Contaminants in Food Chain on a request from theCommission related to ochratoxin A (OTA) as undesirable substance in animal feed." The EFSA Journal 101:1-36.
12. *** Communities, C. o. t. E. (2001). Communication from the Commision to the Council, the European Parliament and the Economic and Social Committee.
13. Community Strategy for Dioxins, Furans and Polychlorinated Biphenyls.
14. *** FDA (1999). Pesticide Analytical Manual (Vol. I: Mutiresidue Methods), FDA.
15. M.J. Hengel, T. S. (2000). "Gas Chromatographic-Mass Spectrometric Method for the Analysis of Dimethomorph Fungicide in Dried Hops." J. Agric. Food Chem. 48: 5824-5828.
16. N.A. Oros, A. M., I.B. Marcus, M. Cristescu, R. Lacatus (2003-2004). "Supravegherea reziduurilor pesticidelor organoclorurate in produsele de origine animala in judetul Alba in perioada 1995-2003."Lucrari stiintifice USAMVB XL VI-XL VII: 356-360.
17. *** (2002). "Ordin privind conditiile de securitate si calitate pentru legume si fructe proaspete destinate consumului uman." Monitorul Oficial al Romaniei, Partea I, Nr. 173/13.III.2002.
18. *** Quality and Accreditation Standards and Guides in Analytical Laboratories: Overview. 2004.
19. ***Validation and Qualification in Analytical Laboratories. 2004.
20. ***Validation of Analytical Methods: Overview. 2004.
21. *** Research, U. F. a. D. A. C. f. D. E. a. (1987). Guideline for Submitting Samples and Analytical Data for Methods Validation. 2005.
22. *** Research), C. C. f. D. E. a. (1994). "Validation of Chromatographic Methods."
23. *** 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.

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

Meets the requirements for training a qualified specialist through its high degree of applicability (e.g. laboratory work) and recent discipline content.
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	Logical, correct and coherent application of acquired notions	Continuous evaluation	50%
10.5. Seminary/Laboratory	The ability to translate into practical theoretical knowledge	Case study examination	50%
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 hours of study (didactical and individual study).

Course coordinator

Assoc. Prof. dr. Crina Mureşan

Şef lucr.dr. Liana Claudia Salanţă

Coordinator of the laboratory/seminary

Assoc. Prof. dr. Crina Mureşan

Şef lucr.dr. Liana Claudia Salanţă

Date of competition
07.09.2021

The discipline Coordonator Prof. dr. Maria Tofană

Head of department

Prof. dr. Ramona Suharoschi

Date of Department's approval
22.09.2021

Dean

Prof. dr. Elena Mudura

Date of FC's approval
28.09.2021