UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No._____of _____ **USAMV form CN-0703040215**

SUBJECT OUTLINE

1. Information on the programme

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine of Cluj-Napoca
1.2. Faculty	Food Science and Technology
1.3. Department	Food Science
1.4. Field of study	Food Engineering
1.5.Education level	Bachelor
1.6.Specialization/ Study programme	**Food Engineering (IPA)**
1.7. Form of education	Full time

2. Information on the discipline

2.1. Name of the discipline	Food products toxicity							
2.2. Course coordinator				Prof dr Ramona Suharoschi				
2.3. Seminar/ laboratory/ project coordinator				Lecturer dr Oana Lelia Pop				
2.4. Year of study	IV	2.5. Semester	**VI**	2.6. Type of evaluation	summative	2.7. Discipline status	Content[2]	DD
							Compulsoriness [3]	DO

3. Total estimated time (teaching hours per semester)

3.1. Hours per week – full time programme		4	out of which: 3.2. lecture	2	3.3. seminar/ laboratory/ project	1
3.4.Total number of hours in the curriculum		42	Out of which: 3.5.lecture	28	3.6.seminar/laboratory	14

	Distribution of the time allotted	hours
	3.4.1. Study based on book, textbook, bibliography and notes	10
	3.4.2. Additional documentation in the library, specialized electronic platforms and field	8
	3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays	5
	3.4.4.Tutorials	5
	3.4.5.Examinations	10
	3.4.6. Other activities	0

3.7. Total hours of individual study		38
3.8. Total hours per semester		75
3.9. Number of credits[4]		3

4. Prerequisites (is applicable)

4.1. curriculum-related	Food Chemistry, Food Biochemistry, Principles of Human Nutrition, General and Special Microbiology; Physical and colloidal chemistry, Analytical chemistry, Organic chemistry, Food additives, Food authentication and falsification 1, Vegetable raw materials
4.2. skills-related	The student must have knowledge regarding the chemical and biochemical characteristics of the compounds specific to living matter; microbiological contaminants; operating IT; office use (xls); Internet browsing; qualities of individual work and participation in professional development

5. Conditions (if applicable)

5.1. for the lecture	Classroom with appropriate capacity equipped with multimedia equipment and internet connection
5.2. for the seminar/ laboratory/ project	Toxicology Laboratory: appropriate equipment - cell cultures (toxicity tests); analytical equipment - evaluation of toxic food compounds in practical eLP works, specialized books

6. Specific competences acquired

Professional competences	C1.1. Description and use of basic concepts, theories and methods in food science (defined in multidisciplinary terms), regarding the structure, properties and transformations of food components and contaminants during the agri-food chain 1-3. Application of basic principles and methods in food science to solve engineering and technological problems, including those related to food safety C5.1- Identification of specialized terminology regarding the quality, standards and hygiene of food products in order to collaborate and cooperate with the responsible institutions in the field of food quality and safety C5.3 - Identify the problems specific to food safety and the responsibilities related to solving them C5.5 - Creating multi-institutional teams designed to find and implement solutions to specific food quality and safety problems
Transversal competences	CT1- Elaboration of a technical study through the efficient use of relevant and current documentation and resources CT1 - Applying strategies of perseverance, rigor, efficiency and responsibility at work, punctuality and taking responsibility for the results of personal activity, creativity, common sense, analytical and critical thinking, problem solving, etc., based on the principles, norms and values of the code professional ethics in the food field. CT3 - Efficient use of various ways and techniques of learning - training for the acquisition of information from bibliographic and electronic databases both in Romanian and in an international language, as well as assessing the need and usefulness of extrinsic and intrinsic motivations of education continue.

7. Course objectives (based on the list of competences acquired)

7.1. Overall course objective	To acquire knowledge regarding the description and use of basic concepts, theories and methods in toxicity (defined in multidisciplinary terms) - foods without risk to public health. Evaluate the design and implementation of risk analyzes, including public health education and food toxicity policies.
7.2. Specific objectives	o interpret the risk, probability, and relevance of toxicity; to know the qualitative and quantitative principles related to toxic risks to know and understand the methods of toxicity testing; To know, understand and apply toxicity testing schemes and alternative toxicity testing schemes; To cynicize and understand silico toxicity testing. Know ways to reduce risk in food and apply risk mitigation schemes

8. Content

8.1.LECTURE **Number of hours – 20**	Teaching methods Lecture	Notes 1 lecture = 2 hours
1. Introductory notions: Implications of the presence of toxic substances in food.	Lecture, explanation and debates	1 hour
2. Dose-Response Relationship	Lecture, explanation and debates	2 hours
3. General principles of toxicity (Absorption, Transport, Storage, Disposal)	Lecture, explanation and debates	2 hours
4. Toxins biotransformation	Lecture, explanation and debates	2 hours
5. Toxicity testing	Lecture, explanation and debates	2 hours
	Lecture, explanation and debates	2 hours

6. Alternative methods for toxicity testing (case studies: natural toxic substances present in food)	Lecture, explanation and debates	1 hour
7. Alternative methods for toxicity tests (case studies: Alternative methods for toxicity tests (case studies: toxic substances of biological pollution)	Lecture, explanation and debates	2 hours
8. Alternative methods for toxicity testing (case studies: toxic substances of pollution and chemical contamination)	Lecture, explanation and debates (evaluation)	1 hour
9. Alternative methods for toxicity testing (case studies: toxic substances resulting from food processing)	Lecture, explanation and debates	1 hour
10. Alternative methods for toxicity testing (case studies: toxic substances in contact materials	Lecture, explanation and debates (evaluation)	1 hour
11. Alternative methods for toxicity testing (case studies: plastics in the food industry)	Lecture, explanation and debates (evaluation)	1 hour
12. Alternative methods for toxicity testing (case studies: detergents)	Lecture, explanation and debates (evaluation)	1 hour
13. Alternative methods for toxicity testing (case studies: food allergies and intolerances)	Lecture, explanation and debates (evaluation)	1 hour
14. Toxicity in silico	Lecture, explanation and debates (evaluation)	

8.2. PRACTICAL WORK **Number of hours –10 hours**	Theoretical presentation of practical works	1 lab work (2 hours / work)
Working instructions and technical norms of work safety in the laboratory. Work organization, fire protection norms and first aid measures in case of accidents. Preparation of samples for the determination of toxins: Stages in the analysis of food toxins: Establishment of the Protocol (SOP); sampling; Sample preparation; Extraction of the analyte and / or compound of interest; Separation; detection; Identification and / or quantification; Data recording: Electrophoretic analysis of tetrodotoxin separation [10, 11]	Practical work	2 hours
Protein extraction, sample purification, electrophoresis: Electrophoretic analysis (separation of tetrodotoxin, milk allergenic proteins[10,11])	Practical work	2 hours
Separation - SDS-PAGE: collation, discoloration, scan-densitometry: Electrophoretic analysis (separation of tetrodotoxin, allergenic milk proteins[10,11])	Practical work	2 hours
Analysis and interpretation of results: Electrophoretic analysis (separation of tetrodotoxin, allergenic milk proteins[10,11])	Practical work	4 hours

Compulsory bibliography:

1. Marutoiu C-tin, Maria Tofana, Analiza micotoxinelor, Ed.Napoca Star, Cluj-Napoca, 2001.
2. Tofana Maria, Aditivii alimentari si conservabilitatea,Editura AcademicPres, Cluj-Napoca, 2003
3. Brad Segal, Constanta Balint, Procedee de imbunatatire a calitatii si stabilitatii produselor alimentare, Ed. Tehnica, Bucuresti, 1982.
4. Banu,C., Preda,N., Vasu,S., Produsele alimentare si inocuitatea lor, Ed.Tehnica Bucuresti, 1982.
5. B Segal, G Popa, Toxicologia produselor alimentare, Ed Academiei, 1986
6. Cotrău, M. 1978, Toxicologie. Principii generale. Ed. Junimea, Bucureşti
7. Dănilă Gh., Cotrău, M., Nechifor, M. 1984, Ghid de date toxicologice. Ed. Medicală, Bucureşti

8. Laslo, C. 1995, Elemente practice de toxicologie alimentară. Tipo Agronomia, Cluj-Napoca
9. Popa, G., Dumitrache, S., Segal, B., Rodica Segal, Apostol, C., Teodoru, V., 1986, Toxicologia produselor alimentare. Ed. Academiei, Bucureşti
10. Tetrodotoxin-binding proteins isolated from five species of toxic gastropods . Food Chemistry, Volume 103, Issue 4, 2007, Pages 1153-1158. Pai-An Hwang, Yung-Hsiang Tsai, His-Pin Lin, Deng-Fwu Hwang
11. Distinction of different heat-treated bovine milks by native-PAGE fingerprinting of their whey proteins. Food Chemistry, Volume 121, Issue 3, 1 August 2010, Pages 803-808. Suju Lin, Jing Sun, Dongdong Cao, Jiankang Cao, Weibo Jiang

Optional bibliography: -

1. Comparative Biochemistry and Physiology Part C: Toxicology & Pharmacology
2. Ecotoxicology and Environmental Safety
3. Environmental Toxicology and Pharmacology
4. Food and Chemical Toxicology
5. Toxicology
6. Toxicology and Applied Pharmacology

9. Corroborating the course content with the expectations of the epistemic community representatives, of the professional associations and of the relevant stakeholders in the corresponding field

The knowledge taught in the course is necessary to know and understand the role of healthy eating and nutrition based on the principles of a balanced diet in ensuring health and the role of the food industry specialist in developing safe, attractive and high nutritional value.

10. Assessment

Type of activity	10.1. Assessment criteria	10.2. Assessment methods	10.3. Percentage of the final grade
10.4. Lecture	periodic or partial tests	Exam	35%
	participation in scientific circles and / or professional competitions	Practical and theoretical skills	5%
10.5. Seminar/Laboratory	Evaluation during the semester	Assignments	20%
	Final evaluation (the scheduled assignments)	Written exam	40%
10.6. Minimum performance standards			
• Solving a concrete food science problem based on a given algorithm • Carrying out a literature study (nutrition and health).			

[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).

Filled in on
08.09.2021

Course coordinator
Prof dr. SUHAROSCHI Ramona

Laboratory work/seminar coordinator
Lecturer. dr.POP Oana Lelia

Subject coordinator
Prof dr. SUHAROSCHI Ramona

Approved by the
Department on
22.09.2021

Head of the Department
Prof dr. SUHAROSCHI Ramona

Approved by the Faculty
Council on
28.09.2021

Dean
Prof dr. MUDURA Elena