UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No._____from _____ **Form code USAMV CN 0701030101**

COURSE DESCRIPTION

1. Information on the program

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 Engineering
1.4. Study field	Food Engineering
1.5. Level field[1)]	Bachelor
1.6. Specialization/ Study Program	Technology of Agricultural Products Processing / TPPA
1.7. Teaching Form	Regular studies

2. Information on the discipline

2.1. Name of the course	**Food additives and ingredients in food industry- technology and applications 1**							
2.2. Course leader				**Prof. dr. Maria Tofană**				
2.3. Coordinator of practice lesson/laboratory activity				**Șef lucr. Biriș-Dorhoi Elena-Suzana**				
2.4. Year of study	III	2.5. Semester	V	2.6. Type of evaluation	Continuous	2.7. Course regime	Content[2]	**DD**
							Level of compulsory[3]	DI

3. Total estimated time (teaching hours/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	6
3.4.2. Extra documentation in the library, on specific electronic platforms and on field	4
3.4.3. Preparation of the seminaries/ laboratories / projecte, themes, papers, portfolies and essays	2
3.4.4.Tutorial	2
3.4.5.Examination	3
3.4.6. Other activities	2

3.7. Total hours individual study	19
3.8. Total hours per semester	75
3.9. Number of ECTS[4]	3

4. Pre-conditions (if applicable)

4.1. of curriculum	Physical and colloidal chemistry, Biochemistry, Food chemistry
4.2. of competences	The student should have knowledge of chemical composition for raw materials and foodstuffs, and about the changes that occurred during processing. Identification, description and appropriate use of specific concepts of food science and food additives

5. Condition (if applicable)

5.1. of course development	Projector, ppt presentation
5.2. of seminary/laboratory/ project development	Laboratory with appropriate analytical equipment, glassware, consumables

6. Specific acquired competences

Professional competences	C4.1. Identification and application of the principles of legislation and regulations in the food field, in order to strictly observe the principles and regulations in force regarding food additives C1.3. Application of basic principles and methods in food science to solve engineering, technological and food safety problems related to the use of food additives
Transversal competences	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 of ethics professional 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 continuing education

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

7.1. Subject general objectives	Rationalizing new trends in the use of additives in food products and in the analytical techniques used for their analysis To acquire skills for the use of additives in food industry
7.2. Specific objectives	To emphasize the necessity of food additives in food industry; present the main classes of additives and the most important representatives of them; follow the mechanism of action of additives such as highlighting allowable doses, the possible adverse effects on human health; studies on the food additives from the following classes : preservatives, antioxidants, emulsifiers and hydrocolloids.

8. Contents

8.1.COURSE **Number of hours – 28**	Methods of teaching	Observations
THE IMPORTANCE OF USING ADDITIVES IN FOOD INDUSTRY Definitions. The classification and codification of food additives; Terms of use of food additives; Principles of toxicological evaluation of food additives; Research methods of food additives. The classification of food additives.	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	2 lectures
EUROPEAN LEGISLATION - European legislative framework, functional classes, provisions and regulations	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	1 lectures
TECHNOLOGIES IN OBTAINING AND USING FOOD PRESERVATIVES. Mechanisms of action in food products, the technological parameters on which they depend; Representatives (Sorbic acid and sorbates, benzoic acid and benzoates, sulfur dioxide, propionic acid and propionates, acetic acid, nitrites / nitrates); Technology for obtaining natural preservative additives;	Lecture, heuristic conversation, debate, algorithmic, case study	4 lectures
OXIDATION OF FOOD PRODUCTS The role of lipids in food; classification of lipid; lipid oxidation; The dynamic of oxidative degradation processes, Oxidation of other components of food product; Enzymatic oxidation of foodstuffs; Thermal degradation of foodstuffs	Lecture, heuristic conversation, debate, algorithmic, case study	2 lectures
ANTIOXIDANTS AND THEIR CLASSIFICATION. Autooxidation of food, Methods of stabilization of		3 lectures

foodstuffs from oxidation; Classification of antioxidants. The choice and areas of application of antioxidants; Representatives (BHT, BHA, galatii, tocopherols, ascorbic acid and ascorbates); Doses of antioxidants used in the food industry. SEQUESTRATION, STABILIZATION, BUFFERING, REINFORCEMENT AND SYNERGISTIC ACTING AGENTS Generalities. Mechanism of action; Representatives (citrates, tartrates, phosphates, EDTA, potassium ferrocyanide, lactation)	Lecture, heuristic conversation, debate, algorithmic, case study	2 lectures

8.2. PRACTICAL WORK **Number of hours – 28**		
Food additives – National and european legislation. Steps in evaluating a food additive. Case Study.	Conversation, argumentation, debate	1 lecture 1 lecture
Preservatives – Substances with preservative role. Factors influencing the shelf life of food product	Debate, algorithmic, case study, heuristic conversation	1 lecture
Preservatives –Benzoic acid and its salts identification		1 lecture
Preservatives – Qualitative Determination of SO_2 and its derivatives	Learning by discovery, debate, case study, conversation, argumentation	1 lecture
Preservatives – Quantitative determination of SO_2 from wines, musts, juices		1 lecture
Preservatives – Determination of boric acid from foods		1 lecture
Quantitative determination of salicylic acid. Drawing of the calibration curve.		2 lectures
Oxidation of foodstuffs – Antioxidant and prooxidant substances		1 lecture
Antioxidants- Factors influencing the enzymatic oxidation of vegetables and fruit		1 lecture
Antioxidants - Qualitative analysis of Butilhidorxianisol (BHA)		1 lecture
Antioxidants – Determination of ascorbic acid in food products		1 lecture
Knowledge verification.		1 lecture

Compulsory Bibliography:

1. Tofană, M, Aditivi alimentari – interacţiunea cu alimentul, 2006, Ed. AcademicPres, Cluj-Napoca.

Facultative Bibliography:

1. Banu C., Stoica A., Bărăscu E., Buţu N., Resmeriţă D., Vizireanu C., Lungu C., Iordan M., 2010, Aplicaţii ale aditivilor şi ingredientelor în industria alimentară, Editura ASAB, Bucureşti
2. Banu, C., Butu N., Lungu C., Alexe P., Resmeriţă D., Vizireanu C., 2000, Aditivi şi ingrediente pentru industria alimentară, Editura Tehnica, Bucureşti

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

Course content is congruent with the applications of professional national specific companies.
In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems, teachers attend the different conferences/workshops/seminars/round tables, where they meet with specialists from the private sector of food industry and with teachers from other higher education institutions in the country. Meetings aimed identifying the needs and expectations of employers in the field and to coordinate the curricula with similar programs in other higher education institutions.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. Course	Logical, coherent and correct application of the acquired notions	Continuous assessment (Evaluation of the answers given to the topics on the exam)	70%
10.5. Seminary/Laboratory	Ability to perform physico-chemical analyzes and interpreting appropriate the result obtained	1 continuous assessment (Practical assessment of professional skills)	30%
10.6. Minimal standard of performance			
Discipline content is in accordance with the applications specific national professional associations In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems, teachers attend the annual meeting of the Association of Food Industry Specialists in Romania, where they meet with specialists from the private sector of food industry and with teachers from other higher education institutions in the country. Meetings aimed identifying the needs and expectations of employers in the field and to coordinate the curricula with similar programs in other higher education institutions.			

[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. Maria Tofană

Laboratory work/seminar coordinator
Șef lucr. 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