No._____from _____ **Form code USAMV CN 0703030110**

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	Food engineering / IPA
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 2**							
2.2. Course leader				**Lecturer PhD Liana Salanţă**				
2.3. Coordinator of practice lesson/laboratory activity				**Lecturer PhD Liana Salanţă**				
2.4. Year of study	III	2.5. Semester	II	2.6. Type of evaluation	Summative	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	15
3.4.2. Extra documentation in the library, on specific electronic platforms and on field	14
3.4.3. Preparation of the seminaries/ laboratories / projecte, themes, papers, portfolies and essays	5
3.4.4.Tutorial	5
3.4.5.Examination	3
3.4.6. Other activities	2

3.7. Total hours individual study	44
3.8. Total hours per semester	100
3.9. Number of ECTS[4]	4

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
EMULSIFIED SYSTEMS Formation of emulsions, the stabilization and destabilizing emulsions	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	1 lecture
TECHNOLOGIES IN OBTAINING AND USING EMULSIFIERS SUBSTANCES Definition. Functions of emulsifiers; Representatives (mixtures of mono and diglycerides, sucroesters, propylene glycol esters with fatty acids, lecithin, sucroglycerides, sorbitol esters, ethoxylated esters, lactic and tartaric acid esters with fatty acids) ; The use of emulsifiers in bakery; The use of emulsifiers in pastry.	Lecture, heuristic conversation, debate, algorithmic, case study, directed observation	3 lectures
TECHNOLOGIES IN OBTAINING AND USING HYDROCOLLOIDS. Generalities. The functional properties of hydrocolloids. Classification Representatives (Exudates from trees, gums from seeds, extracts from plants, extracts from algae, fermentation gums, starch, cellulose derivatives, animal proteins, vegetable proteins, polydextrose)	Lecture, heuristic conversation, debate, algorithmic, case study	4 lectures
FLAVORS, FLAVORING AND FLAVOR ENHANCERS Definition. The flavor of foodstuff; reactions with formation of flavour compounds in foodstuffs which undergoes heat treatment; Flavoring agents and their classification (Natural flavoring , Synthetic flavoring, Synthetic flavoring in mixtures, Thermal process flavouring; Flavor enhancers; Smoke flavouring)	Lecture, heuristic conversation, debate, algorithmic, case study	2 lectures
ACIDULANTS Generalities; Representatives (lactic acid, citric acid,	Lecture, heuristic conversation, debate, algorithmic, case study	1 lecture

tartaric acid, malic acid, fumaric acid, adipic acid, phosphoric acid) SWEETENERS Nonnutritive sweeteners; Nutritive sweeteners; Synthetic sweeteners NATURAL AND SYNTHESIS DYES Technologies in obtaining and using natural dyes (anthocyanins, betacins, carotenoids, porphyrin dyes, chalcon dyes, anthraquinone dyes, flavonic dyes) Advantages and disadvantages of using synthetic dyes (red, yellow, orange, blue, green, black, brown dyes)		 1 lecture 2 lectures

8.2. PRACTICAL WORK **Number of hours – 28** Emulsifiers – The highlighting of the emulsifiers actions Emulsifiers – Extraction and identification of lecithin from egg yolk Emulsifiers – qualitative verification to soy lecithin Emulsifiers – obtaining of emulsified products Hydrocolloids – Identification of starch from meat and meat products Hydrocolloids – Extraction of pectin from fruits Hydrocolloids – Determination of the degree of esterification of pectic substances Hydrocolloids – Use in the design of new foodstuffs Colorants – Identification of synthetic dyes in vinegar Colorants - Obtaining the anthocyanins from red cabbage Colorants – Anthocyanins from red cabbage- acid-base indicators Colorants – Methods of extraction of dyes from plant sources Colorants – UV-Vis characterization of dyes extracted Knowledge verification.	 Conversation, argumentation, debate Debate, algorithmic, case study, heuristic conversation Learning by discovery, debate, case study, conversation, argumentation	 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 1 lecture 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

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.

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	Exam (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
Lect. Dr. Liana Salanţă

Laboratory work/seminar coordinator
Lect. Dr. Liana Salanţă

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