



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA

Calea Mănăstur 3-5, 400372, Cluj-Napoca

Tel: 0264-596.384, Fax: 0264-593.792

www.usamvcluj.ro

No. _____ of _____

USAMV form 0702010110

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 -2
1.4. Field of study	Food Product Engineering
1.5. Education level	Bachelor
1.6. Specialization/ Study programme	Food control and expertise (CEPA)
1.7. Form of education	Full time

2. Information on the discipline

2.1. Name of the discipline	FOOD CHEMISTRY							
2.2. Course coordinator	Prof. Dr. Dan Vodnar							
2.3. Seminar/ laboratory/ project coordinator	Asistent Dr. Lavinia Muresan							
2.4. Year of study	I	2.5. Semester	II	2.6. Type of evaluation	Summative	2.7. Discipline status	Content ²	BD
							Compulsoriness ³	DI

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	2
3.4. Total number of hours in the curriculum	56	Out of which: 3.5. lecture	28	3.6. seminar/laboratory	28
Distribution of the time allotted					hours
3.4.1. Study based on book, textbook, bibliography and notes					20
3.4.2. Additional documentation in the library, specialized electronic platforms and field					10
3.4.3. Preparing seminars/ laboratories/ projects, subjects, reports, portfolios and essays					16
3.4.4. Tutorials					13
3.4.5. Examinations					10
3.4.6. Other activities					
3.7. Total hours of individual study	69				
3.8. Total hours per semester	125				
3.9. Number of credits ⁴	5				

4. Prerequisites (is applicable)

4.1. curriculum-related	Organic Chemistry
4.2. skills-related	Students must have basic knowledge on fundamental Organic Chemistry from high school

5. Conditions (if applicable)

5.1. for the lecture	The course is interactive, students can ask questions regarding the content of lecture. Academic discipline requires compliance with the start and end of the course. We do not allow any other activities during the lecture, mobile phones will be turned off.
----------------------	--



6. Specific competences acquired

P r o f e s s i o n a l c o m p e t e n c e s	<p>C1.1. Description and use of basic concepts, theories and methods in food chemistry related to the structure, properties and transformations of components (nutrients and phytochemicals) in food during the agri-food chain.</p> <p>C1.2. Description and use of basic concepts, theories and methods regarding the chemical composition of food, classification of food according to the share of nutrients, evaluation of food quality, in the agri-food chain, from raw material to finished product. The transformations that the food matrix undergoes during the processing and the modifications of the different components are described, from a rheological and chemical point of view. Changes during food transportation and storage are described, as well as methods and equipment used to measure quality and safety parameters.</p> <p>C1.3. Explain and interpret concepts, processes, models and methods specific to food science, using basic knowledge of the composition, structure, properties and transformations of the food matrix during processing, storage and storage</p> <p>3.1. Demonstrate willingness for professional development by training the skills of critical thinking</p>
T r a n s v e r s a l c o m p e t e n c e s	<p>CT1. Stimulating analytical and synthetic thinking, efficiency in learning notions, perseverance, through rigor and responsibility for the results of personal activity, creativity, common sense, learning based on problem solving (Problem-based learning).</p> <p>CT2. Respecting the principles, norms and values of the code of professional ethics in the food field.</p> <p>Applying interrelationship techniques within a team; stimulating interpersonal communication, teamwork, based on specific responsibilities, with optimal time management.</p>

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

7.1. Overall course objective	Assimilation of the fundamental notions of food structure and functionality, from the raw material to the finished product, from the composition into nutrients, metabolic regulation compounds, to the study of the mechanisms of transformation of food components during processing and storage. The course includes specific information on
-------------------------------	---



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA

Calea Mănăstur 3-5, 400372, Cluj-Napoca

Tel: 0264-596.384, Fax: 0264-593.792

www.usamvcluj.ro

out

	<p>The practical works aim at achieving specific laboratory work skills, skills for interpreting the results and their significance. The student practices the most representative techniques for evaluating the composition and quality of food. The theme of the practical works closely follows the theme of the course.</p>
7.2. Specific objectives	<p>The course includes the following chapters: the chemical characteristics of the main nutrients in food, the classification and general characterization of foods according to the composition, digestion and absorption of food, the differentiated nutritional intake of nutrients. Recent data on the chemical composition of food of plant and animal origin, changes in protein, carbohydrate or lipid components, enzymatic or vitamin degradation during food processing are selected and systematized.</p> <p>Particular attention is paid to practical knowledge and skills for the analysis and control of food quality, the proper use of laboratory equipment, as well as the identification and dosing of chemical compounds in food.</p> <p>The acquired notions are useful for other technological disciplines and those based on the analysis and control of raw materials and finished products. Also, the basics of bioactive compounds in food are useful for disciplines that address issues of nutrition, toxicology, food control.</p>

8. Content

	Teaching methods	Notes
<p>I. CLASSIFICATION AND CHARACTERIZATION GENERAL FOOD CHEMISTRY</p> <p>I.1. Terminology and general food classification.</p> <p>I.2. Classification and general characterization of foods, according to major nutrients</p> <p>I.3. Structural, physiological characteristics and technological changes of the main nutrients in food</p> <p>I.4. General biological and technological transformations of nutrients during raw material processing</p> <p>I.5. Nutrient metabolism. Physiological and energetic value.</p> <p>II. CHEMICAL COMPOSITION OF FOOD</p> <p>II.1. Mostly protein foods: meat, milk, fish and eggs</p> <p>II.2. Mostly carbohydrate foods: flour and sugar products</p> <p>II.3. Edible fats and oils</p> <p>II.4. Alcoholic and non-alcoholic beverages</p> <p>II.5. Vegetables and fruits</p> <p>III. CHANGES IN CHEMICAL COMPOSITION DURING FOOD PROCESSING AND STORAGE</p> <p>III.1. Changes in the composition of meat products</p> <p>III.2. Changes in the composition of dairy products</p> <p>III.3. Changes in the composition of cereal, milling and bakery products</p> <p>III.4. Changes in the composition of vegetables and fruits</p>	Lectures	<p>4 lectures = 8 hours</p> <p>6 lectures = 12 hours</p> <p>4 lectures = 8 hours</p>
1. Determination of dry matter in foodstuffs	<p>Theoretical presentation of practical works</p> <p>Practice and seminar</p>	1 lab work (2 hours)



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA

Calea Mănăstur 3-5, 400372, Cluj-Napoca

Tel: 0264-596.384, Fax: 0264-593.792

2. Determination of invert sugar using Dextran method	Practice and seminar	1 lab work (2 hours)
3. Determination of invert sugar using Dextran method	Practice and seminar	1 lab work (2 hours)
4. Fats - Characterization of fats	Practice and seminar	1 lab work (2 hours)
5. Determination of fat in butter	Practice and seminar	1 lab work (2 hours)
6. Proteins - Determination of proteic nitrogen	Practice and seminar	1 lab work (2 hours)
7. Proteins - Determination of milk proteins Bradford method	Practice and seminar	1 lab work (2 hours)
8. Determination of synthetic organic dyes from paprika	Practice and seminar	1 lab work (2 hours)
9. Dosage of vitamin C by Indophenol method	Practice and seminar	1 lab work (2 hours)
10. Determination of SO ₂ in white wine	Practice and seminar	1 lab work (2 hours)
11. Dosage of sodium in food	Practice and seminar	1 lab work (2 hours)
12. Determination of the diastase index in honey	Practice and seminar	1 lab work (2 hours)
13. Identification and dosage of HMF in honey	Practice and seminar	1 lab work (2 hours)
14. Determining the quality of vegetable oils	Practice and seminar	1 lab work (2 hours)
Compulsory bibliography: <ol style="list-style-type: none"> 1. Carmen Socaciu, <i>Chimia alimentului</i>, Editura Academic Press Cluj-Napoca, 2018 2. G.Neamțu, <i>Biochimie alimentara</i>, Editura Ceres, 1997 3. Ghimicescu G., <i>Chimia și Analiza Băuturilor și Condimentelor</i>, Ed.Junimea, Iași, 1977 4. Carmen Socaciu, Otilia Bobis, Carmen Iuliana Momeu, <i>Chimia Alimentelor – Caiet de lucrari practice si teste</i>, Editura Academic Press Cluj-Napoca, 2003 		
Optional bibliography: <ol style="list-style-type: none"> 1. C.Nenițescu, <i>Chimie generală</i>, Ed.Did. și Ped., București, 1973 2. Popescu N. (ed), <i>Metode fizico-chimice pentru examenul de laborator al produselor alimentare de origine animală</i>, Ed.Min.Agriculturii, Dir.Sanitar-veterinară, 1978 3. Fennema L. <i>Food Chemistry</i>, AMC Press, Los Angeles, 1995 		

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 course and practical works provide necessary and enough information to be applied in food quality and safety control laboratories, from health departments, Consumer Protection Agencies, the Association of Food Industry Specialists (ASIAR) in Romania and economic agents in the industry. grocery shop.

10. Assessment

Type of activity	10.1. Assessment criteria	10.2. Assessment methods	10.3. Percentage of the final grade
10.4. Lecture	Identify the main classes of nutrients of plant and animal origin Knowledge of food properties, depending on the chemical composition Changes in the composition of food during processing and storage	Verification along the semester (a written verification <i>online</i>) Exam (face to face or <i>online</i>)	75%
10.5. Seminar/Laboratory	Theoretical and practical knowledge of the analysis methods used in the food chemistry laboratory. Solving stoichiometric problems with practical applicability (concentrations, purity, yield).	Verification – Colloquium face-to-face or <i>online</i>	25%

10.6. Minimum performance standards

Description of the main characteristics of a food product specific steps of a spectrometric analysis
Accumulation and systematization of scientific information transmitted through lectures and practical papers at an acceptable level. Obtaining the passing grade for the ongoing checks is a condition of pass ability..

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).



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA

Calea Mănăștur 3-5, 400372, Cluj-Napoca

Tel: 0264-596.384, Fax: 0264-593.792

www.usamvcluj.ro

³ C

subiectul...

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

Filled in on
09.09.2021

Course coordinator
Prof. Dr. Dan Vodnar

Laboratory work/seminar coordinator
Asistent Dr. Lavinia Muresan

Subject coordinator
Prof. Dr. Dan Vodnar

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