



UNIVERSITATEA DE ȘTIINȚE AGRICOLE ȘI MEDICINĂ VETERINARĂ CLUJ-NAPOCA

Calea Mănăștur 3-5, 400372, Cluj-Napoca

Tel: 0264-596.384, Fax: 0264-593.792

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Nr. _____ din _____

Formular USAMV 0709010102

COURSE DESCRIPTION

1. General data

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary Medicine
1.2. Faculty	Faculty of Food Science and Technology
1.3. Department	Food Science
1.4. Study field	Food Engineering
1.5. Study level	Master
1.6. Specialization/ Study Program	Gastronomy, Nutrition and Dietetics
1.7. Teaching Form	FT

2. Course Characteristics

2.1. Name of the course	Molecular Gastronomy							
2.2. Course leader	Prof. Dr. Dan Cristian VODNAR							
2.3. Coordinator of the laboratory/seminar activity	Prof. Dr. Dan Cristian VODNAR							
2.4. Year of study	I	2.5. Semester	I	2.6. Type of evaluation	Summative	2.7. Course regime	Content ²	DS
							Level of compulsory ³	DI

3. Total estimated time (hours/semester for the teaching activities)

3.1. Number of hours/week – frequency form	3	of which: 3.2. course	2	3.3. seminar/ laboratory/ project	1
3.4. Total hours in the curricula	42	of which: 3.5. course	28	3.6. seminar/laboratory	14
Distribution of time					hours
3.4.1. Study based on handbook, notes, bibliography					5
3.4.2. Extra documentation in the library, on specific electronic platforms and on field					3
3.4.3. Prepare the seminars / laboratories / projects, theme, essays, reports, portfolio					2
3.4.4. Tutorial					0
3.4.5. Examination					4
3.4.6. Other activities					
3.7. Total hours of individual study	69				
3.8. Total hours per semester	125				
3.9. Number of ECTS ⁴	5				

4. Pre-conditions (where is the case)

4.1. of curriculum	Nutrients and food ingredients, Gastronomy
4.2. of competences	The student must have knowledge of chemical reactions involved in food processes, products' rheology, as well as notions about molecular interactions.

5. Conditions (where is the case)



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5.1. of course development	The course is interactive, students can ask questions about the content of the presentation. The university discipline requires the observance of the start and end time of the course. No other activities are tolerated during the lecture, mobile phones must be switched off.
5.2. of seminar/laboratory/project development	At the practical works it is mandatory to consult the practical guide, each student will carry out an individual activity with the laboratory materials provided and described in the Practical works guide. Academic discipline is required throughout the work.

6. Specific acquired competences

Professional competences	C1. Evaluation, processing and interpretation of human nutrition data; C2. Description and analysis of gastronomic techniques and technologies for implementation in public catering and agrotourism units; C3. Optimization, elaboration and implementation of technological projects, nutritional and dietary solutions according to different target groups and based on the use of technical knowledge associated with the field; C4. Providing consultancy in the design of food (gastronomic) products with sensory, physico-chemical and nutritional properties adequate to maintain the health of the human body; C5. Implementation and monitoring of European food safety and security policies and strategies; C6. Design and implementation of research and education / training programs.
Transversal competences	CT1: Realization of complex, interdisciplinary, individual projects; CT2: Realization of complex, interdisciplinary projects, with the coordination of a team; CT3: Carrying out a complex, interdisciplinary scientific paper.

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

7.1. Subject general objectives	To acquire current knowledge in the field of molecular gastronomy existing at this time worldwide.
7.2. Specific objectives	Understand the structural reformulation of food products. To be able to make products resulting from the application of molecular mixology. To know the principles of molecular gastronomy so that they can make products with a high degree of innovation.

8. Content



8.1.COURSE Number of hours – 28	Teaching methods	Observations
Introduction in molecular gastronomy. What is molecular gastronomy? Molecular gastronomy: a tripartite discipline. Gastronomic secrets. Ephemerization of gastronomy. Colloidal stability.	Lecture	1 Lecture
4 Basic molecules for food: water, lipids, proteins and carbohydrates and the effect of temperature on them. Chemistry and physics of molecules, the interaction between molecules, methods of affecting the molecular interaction. Macromolecules, water, acid / base reactions and physical transformations due to heat and cold.	Lecture	3 Lectures
Protein food Chemical and physical attributes of dairy proteins: milk, cream, and yogurt. Protein coagulation. Chemical and physical attributes of egg proteins: factors that affect the volume and stability of egg foams. Chemical and physical attributes of meat proteins: Maillard reactions for flavor development. Tendering methods.	Lecture	3 Lectures
The physiology of aroma Taste and Digestion of Flavors. Flavor Detection. Chewing. Sensitivity and juiciness. Case studies: Fondue, fermented soufflé.	Lecture	1 Lecture
Vegetal food Fruits and vegetables: Modification of protein and carbohydrate structures by water and heat. The effect of heat and saturation in the crystallization of carbohydrates.	Lecture	2 Lectures
Investigations and Models Structural changes in bakery. Culinary paradoxes. Foams, Al Dente, Unused vegetables, Flavor intensification by molecular changes.	Lecture	2 Lectures
Gastronomy of the future Vacuum preparations, Flavors or molecular reactions? Butter: False structure, Liver mousse, Order of molecular size, Egg - in hundreds of years, Fortified cheese, Texture changes.	Lecture	2 Lectures



8.2. Seminar/Projects Number of hours – 14 Formulation of microspheres by the classical method and by the inverse sphericization method. Obtaining and characterizing molecular cocktails. Structural reformulation of Capresse salad. Obtaining fruit spaghetti. Structural reformulation of plant molecular desserts.	The study of molecular interactions The study of molecular interactions The study of molecular interactions The study of molecular interactions The study of molecular interactions The study of molecular interactions	2 practical works 1 practical work 2 practical works 1 practical work 1 practical work
Compulsory bibliography: 1. Harold McGee, <i>On Food and Cooking: The Science and Lore of the Kitchen</i> (New York: Scribner, 2004). ISBN: 9780684800011 2. Hervé This, <i>Kitchen Mysteries: Revealing the Science of Cooking</i> , trans. Jody Gladding (New York: Columbia University Press, 2007). ISBN: 978-0231141710		
Optional bibliography: Hervé This, <i>Molecular Gastronomy: Exploring the Science of Flavor</i> , trans. M. B. Debevoise (New York: Columbia University Press, 2006) ISBN: 9780231133128		

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 to modernize and continuously improve the teaching and content of the courses, with the most current topics and practical problems, teachers consult the international literature.

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 consistent application of the acquired notions	Oral Exam	70 %
10.5. Seminar/Laboratory	Acquiring professional skills Ability to analyze and interpret results Project	Project	30 %
10.6. Minimal standard of performance			
Mastery of scientific information transmitted through lectures and practical work at an acceptable level. Obtaining the pass mark for the ongoing checks is a condition of passing the exam.			

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**



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(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).

Leader of the laboratory/seminar

Prof. Dr. Dan C. Vodnar

Date of completion

09.09.2021

Course coordinator

Prof. Dr. Dan C. Vodnar

Subject coordinator

Prof. Dr. Dan Vodnar

Date of Department's
approval.

22.09.2021

Department manager

Prof. .Dr. Ramona Suharoschi

Faculty Council Approval

28.09.2021

Dean

Prof.dr. Elena Mudura