UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No_____from _____ **Form code USAMV–CN 0705010101**

COURSE DESCRIPTION

1. D General data

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)]	**Master**
1.6. Specialization/ Study Program	**Systems for the processing and control of food quality**
1.7. Teaching Form	**IF**

2. Course characteristics

2.1. Name of the course	**MODERN PRINCIPLES OF FOOD PROCESSING 1**							
2.2. Course leader	Associate PhD. Dorin ŢIBULCĂ Associate PhD. Dan SĂLĂGEAN							
2.3. Coordinator of laboratory/seminary/project	Associate PhD. Dorin ŢIBULCĂ Associate PhD. Dan SĂLĂGEAN							
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 of the teaching activities)

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	30
3.4.2. Extra documentation in the library, on specific electronic platforms and on field	29
3.4.3. Preparation of seminaries/ laboratories/ projects, themes, papers, portfolies and essays	35
3.4.4.Tutorial	5
3.4.5. Examination	20
3.4.6. Other activities	

3.7. Total hours of individual study	119
3.8. Total hours per semester	175
3.9. Number of ECTS[4]	7

4. Pre-conditions (where appropriate)

4.1. of curriculum	Unit Operations in the food Industry, Equipment used in food indusry, Food chemistry Biochemistry, Food microbiology, Methods of Food preservation, Food Technologies
4.2. of competences	The student should have knowledge of food biochemistry, unit operations in the food industry, food microbiology, food additives, methods of food preservation, food technologies, communication in Romanian, digital skills

5. Conditions (where appropriate)

5.1. of course development	The course is interactive; students can ask questions regarding the content of the statement. Academic discipline requires compliance of starting time and end of the course. Room with PC unit, video projector, projection screen, blackboard, internet

	connection. Development of the topic proposed in the discipline sheet and interactive discussions based on the previously announced materials and bibliography, doubled by materials presented on the video projector. In the case of the didactic activity carried out online, the teaching methods will be adapted.
5.2. of seminary/laboratory/ project development	Every student will develop an individual activity based on material and laboratory materials provided, based on the procedure described in the practical work advisor. The outfit must be appropriate (white robe, cap, disposable cover dispensers, gloves). Pilot station equipped with PC unit, video projector, internet connection, projection screen, blackboard, equipment, machinery, utensils, raw materials, auxiliaries, materials. The students prepare essays on themes established in the laboratory. In the case of the didactic activity carried out online, the teaching methods will be adapted.

6. Specific acquired competences

Professional competences	C1.1 Identify the principles and methods for developing technical specifications for processes and products in the food industry C1.2 Explanation and interpretation of methods for evaluating processes specific to agri-food production C1.3 Integrated use of concepts and methodologies for planning and coordinating technological activities C1.4 Use of high-performance criteria and methods for the periodic evaluation of the quality of processes and products C1.5 Development of projects on monitoring, evaluation and development of studies to optimize technological flows in order to reduce specific consumption C6.3 Integrated use of classical and modern technologies for food production
Transversal competences	CT1 Realization of complex, interdisciplinary, individual projects

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

7.1. Subject general objectives	To appropriate the principles of food product processing (meat and milk)
7.2. Specific objectives	To know the factors that determine the quality of raw materials used in the process of manufacturing of meat products To know the protein additions, the usage patterns and their influence in the process of manufacturing of meat products To know the factors which influence the quality of meat emulsions To know the influence of refrigerating processing and salting and smoking processes on the quality of meat and meat products To know the influence of thermal treatments on the quality of meat products To know new manufacturing technologies of meat products To know the manufacture of meat products in continuous flow To know the unconventional manufacturing cheese processes To know the membrane processes, applied in the manufacture of cheese To know the alternatives to pasteurization of milk To know the enzyme- modified cheese To know the microwave applications in food processing

8. Contents

8.1. COURSE **Number of hours – 28**	**Methods of teaching**	**Observations**
1. The influence of raw material quality on meat	Developing the theme and	1 hour

products, influence of meat with abnormal conditions (PSE and DFD) on quality of semifinished and common meat products	interactive discussions, projector	
2. The maturation of meat [enzymatic and physico-chemical mechanism; the variation of maturation factors (species, age, sex, race, state of fattening type of muscle); ways to accelerate the maturation of meat]	Developing the theme and interactive discussions, projector	1 hour
3. The influence of protein additions on the quality of meat products	Developing the theme and interactive discussions, projector	2 hours
4. Meat emulsions - the main factor of meat products quality (meat proteins - emulsifiers and emulsion stabilizers of meat; the factors who influence the quality of meat emulsions; The preparation of the meat emulsions)	Developing the theme and interactive discussions, projector	2 hours
5. The influence of refrigeration, freezing, salting and smoking processes, on the quality of meat and meat products	Developing the theme and interactive discussions, projector	2 hours
6. The influence of thermal treatment on the quality of meat products	Developing the theme and interactive discussions, projector	1 hour
7. The thermal processing of meat products using modern methods: [the thermal processing with high frequency currents and microwave; the thermal processing with industrial frequency current; processing with infrared radiation; the modern methods of sterilization of canned meat - sterilization with ionizing radiation (cold sterilization)]	Developing the theme and interactive discussions, projector	1 hour
8. New/ current technologies production of meat	Developing the theme and interactive discussions, projector	2 hours
9. The manufacture of meat products in continuous flow	Developing the theme and interactive discussions, projector	2 hours
10. Unconventional methods of manufacture of cheese	Lecture, heuristic conversation , explanation	2 hours
11. Membrane processes applied in the manufacture of cheese (ultrafiltration, reverse osmosis, types of cheeses obtained by the membrane processes)	Lecture, heuristic conversation , explanation	4 hours
12. Alternatives to pasteurisation (treatment with hydrogen peroxide , the activation of lactoperoxidase - H_2O_2-thiocyanate, milk bactofugare, milk microfiltration	Lecture, heuristic conversation , explanation	2 hours
13. Enzyme- modified cheese	Lecture, heuristic conversation , explanation	1 hour
14. Microwave applications in food processing	Lecture, heuristic conversation , explanation	5 hours

8.2. PRACTICAL WORK **Number of hours – 28**		
Uses of animal protein additions in the technology of manufacturing of meat products	Practical applications	2 hours
Uses of vegetable protein additions in the technology of manufacturing of meat products	Practical applications	2 hours
New/ current technologies manufacturing of meat in membrane	Practical applications	2 hours
New/ current technologies manufacturing of meat products without membrane (smoked products and specialties)	Practical applications	2 hours
The manufacture of “aerated” meat products and	Practical applications	2 hours

Sausage without membrane New / current technologies of manufacturing of dry – cured- smoked - matured meat products	Practical applications	2 hours
The behavior of the proteins in the milk under the action of pasteurization and sterilization temperature	Practical applications	2 hours
Physico-chemical parameters of dehydrated dairy products	Practical applications	2 hours
The influence of technological operations on cream the process of obtaining butter	Practical applications	2 hours
The influence of the technological operations on the milk during the cheese production	Practical applications	4 hours
Factors that influence the processing of curds in the manufacture of cheese	Practical applications	2 hours
Knowledge verification. / Referates along the way	4 continuous assessment and supporting referates	4 hours

Compulsory Bibliography:

1. Banu, C., 1992 şi 1993, Progrese tehnice, tehnologice şi ştiinţifice în industria alimentară, vol I, II, Ed. Tehnică, Bucureşti;
2. Banu, C., 1996, Metode de conservare aplicate în industria cărnii, editat Universitatea "Dunărea de Jos", Galaţi;
3. Banu, C., 1998 şi 1999, Manualul inginerului de industrie alimentară, vol.I, II, Editura Tehnică, Bucureşti;
4. Georgescu, Gh., Banu, C., ş.a., 2000, Tratat de producerea, procesarea şi valorificarea cărnii, Editura Ceres, Bucureşti
5. Banu, C., 2003, Procesarea industrială a cărnii, Ed. Tehnică, Bucureşti;
6. Banu, C., 2009, Tratat de industrie alimentară, Ed. ASAB, Bucureşti;
7. Costin, G. M., Florea, T., 1997, Aplicaţii ale separării prin membrane în biotehnologie şi industria alimentară, Editura Academica, Galaţi;
8. Costin G. M. Şi colab., 2003, Ştiinţa şi ingineria fabricării brânzeturilor, Ed. Academică, Galaţi;
9. Sălăgean, C. D., Ţibulcă, D., 2009, Tehnologia semiconservelor şi conservelor din carne şi peşte, Editura Risoprint, Cluj-Napoca;
10. Stănescu, V., Apostu, S., 2010, Igiena, inspecţia şi siguranţa alimentelor de origine animală, vol. I, II şi III, Editura Risoprint, Cluj-Napoca;
11. Sălăgean, C. D., 2011, Tehnologia şi controlul calităţii pe fluxul tehnologic de fabricaţie a produselor din carne, Editura Risoprint, Cluj-Napoca.
12. Ţibulcă, D., Sălăgean, C. D., 2016, Procesarea cărnii, vol. 2, Editura Risoprint, Cluj-Napoca

Facultative Bibliography:

1. Banu, C., 1997, Procesarea industrială a cărnii, Ed. Tehnică, Bucureşti;
2. Banu, C., 2000, Biotehnologii în industria alimentară, Ed. Tehnică, Bucureşti;
3. Banu, C., ş.a., 2000, Aditivi şi ingrediente pentru industria alimentară, Editura Tehnică, Bucureşti;
4. Costin, G. M. şi colab. (1999), Alimente funcţionale, Editura Academiei, Bucureşti;
5. Laslo, C. şi colab., 2008, Controlul calităţii şi igiena produselor alimentare de origine animală, Editura Risoprint, Cluj-Napoca;
6. Segal, Rodica, 1998, Biochimia produselor alimentare, volumul I, II, Editura Alma, Galaţi
7. Journal of Food Science
8. ******* , M.A.I.A.-C.O.C.P.C.I.A., 1985, Colecţie de standarde pentru industria cărnii, Bucureşti
9. ***, C.I.C.-C.O.C.B., 1987, Instrucţiuni tehnologice de fabricare a preparatelor din carne, Bucureşti
10. ***, A.A.-C.O.C.P.C.I.A., 1991, Colecţie de standarde de ramură-preparate din carne, Bucureşti
11. ***, 1994, Standarde de stat şi norme tehnice de calitate. Carne şi preparate de carne, Bucureşti
12. ***, 1997, Institutul Român de Standardizare, Culegere de standarde române comentate (conserve de carne), Bucureşti
13. ***, 2003, Principii generale de igienă alimentara, Codex Alimentarius

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

The content of the discipline is in accordance with the requests of specific national professional associations

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. **Course**	Logical and correctly application of concepts learned Assimilation of knowledge	Oral Exam	50%
10.5. Laboratory	Applying the knowledge about modern technologies for obtaining meat products and cheese and knowledge of use the microwave in food processing	Continuous assessment / Support report	50%
10.6. Minimal standard of performance			
Elaboration of a technological project			

[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 de hours of study (didactical and individual study).

Course coordinator
Associate Professor PhD. Dorin Ţibulcă

Associate Professor PhD. Dan Sălăgean

Laboratory work/seminar coordinator
Associate Professor PhD. Dorin Ţibulcă

Associate Professor PhD. Dan Sălăgean

Filled in on
09.09.2021

Subject coordinator
Associate Professor PhD. Dorin Ţibulcă

Head of the Department
Professor PhD. Sevastiţa Muste

Approved by the Department on
22.09.2021

Dean
Professor PhD. Elena Mudura

Approved by the Faculty Council on
28.09.2021