UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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No._____from _____ **Form code USAMV–CN 0703040104**

SUBJECT OUTLINE

1. Information on the programme

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. Field of study	Food Engineering
1.5.Cycle of study[1]	Bachelor
1.6. Specialization/ Study programme	**Food Engineering**
1.7. Form of education	Regular studies

2. Information on the discipline

2.1. Name of the course	**Milk processing 2**							
2.2. Course leader	**Associate professor PhD. Dorin Ţibulcă**							
2.3. Seminar/ laboratory/ project coordinator	**Associate professor PhD. Mirela Jimborean** **Assistant PhD. Delia Michiu**							
2.4. Year of study	IV	2.5. Semester	VII	2.6 Type of evaluation	continue	2.7. Discipline status	Content[2]	AP
							Compulsoriness[3]	CD

3. Total estimated time teaching hours per semester)

3.1. Hours per week – full time programme	4	Of which: 3.2.course	2	3.3. laboratory	4
3.4. Total number of hours in the curriculum	56	Of which: 3.5.course	28	3.6. Laboratory	28
Distribution of 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					20
3.4.4. Tutorials					9
3.4.5. Examinations					10
3.4.6. Other activities					0
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	Food biochemistry, Unit operation in Food Industry, Food Industry equipment, Animal raw materials, Transfer phenomena, Food microbiology, Agri-food hygiene
4.2. skills-related	General knowledge of food engineering, communication in Romanian, digital skills

5. Conditions

5.1. for the lecture	The course is interactive, students can ask questions about the content of the presentation. Academic discipline requires compliance with the start and end of the course. Classroom equipped with PC unit, video projector, projection screen, blackboard. No other activities are tolerated during the lecture, mobile phones are switched off. Attendance required at the course: minimum 50%. In the case of the didactic activity carried out online, the teaching methods will be adapted
5.2. for the seminar/ laboratory/ project	For practical work, it is mandatory to consult the practical guide. Each student will participate in the practical work. Academic discipline is required throughout the work. The outfit must be appropriate (white robe, cap, disposable cover dispensers, gloves).

	Pilot station equipped with PC unit, video projector, projection screen, blackboard, equipment, machinery, utensils, raw materials, auxiliaries, materials. Presence required: 100% (absences must be recovered). In the case of the didactic activity carried out online, the teaching methods will be adapted

6. Specific competences acquired

Professional competences	C3.1. Description and use of concepts, basic methods and theories regarding the technologies of dairy industry C3.2. Explanation and interpretation of the principles and methods used in technological processes of dairy industry C2.3. Application of basic engineering principles and methods for solving technological problems in the agri-food chain C3.5. Elaboration of projects related to technologies and products specific to the dairy industry.
Transversal competences	CT1. Application of strategies of perseverance, rigor, efficiency and responsibility in work, punctuality and assuming responsibility for the results of personal activities, creativity, common sense, analytical and critical thinking, problem solving etc., based on the principles, norms and values of the code of professional ethics in the food industry.

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

7.1. Overall course objective	Development of general practical skills Acquiring knowledge on dried dairy products and cheese manufacturing technology
7.2. Specific objectives	Raw material characterization The knowledge of the biochemical processes which underly the obtaining of cheese The interpretation of technological schemes and the description of technologies for varieties of cheese The characterization of final products The understanding of the role and importance of technology in relation to other disciplines and the correlation of the knowledge from the disciplines that concern the general specialty training Notions regarding the implementation of the HACCP system in the manufacture of dried dairy products and cheeses

8. Contents

8.1. COURSE **Number of hours - 28**	Teaching methods	Notes
Dairy powder technology	Lecture, heuristic conversation, explanation	2 hours
General technology manufacturing cheese Preparing milk coagulation The coagulation of milk. Processing curd Training and pressing cheese Salting cheeses Rippening cheeses Packing cheese Implementation of the HACCP system for cheese making	Lecture, heuristic conversation, explanation	14 hours
Manufacturing technology main types of cheese (Fresh cheese, Soft cheeses, Cheeses ripened in brine, Semi-hard cheeses, Hard cheeses, Scalded cheese, Cheese kneaded, Processed cheese)	Lecture, heuristic conversation, explanation	8 hours
Modern cheese making processes Processes for the mechanical manufacture of soft cheeses Processes for the continuous manufacture of cheeses Processes for making soft cheeses using milk ultrafiltration Processes for obtaining peeled cheeses	Lecture, heuristic conversation, explanation	4 hours
8.2. PRACTICAL WORKS **Number of hours - 14**		
Technological calculations the manufacture of cheese. The determination of coagulation and clot demand calculation for	Exercise, demonstration, observation	2 hours

coagulating milk.		
Getting a fresh cheese	Practical demonstration, observation	2 hours
Cheese ripened in brine	Practical demonstration, observation	2 hours
Dutch cheese	Practical demonstration, observation	3 hours
Manufacture of processed cheeses	Practical demonstration, observation	2 hours
Manufacture of cow's milk scalded cheese	Practical demonstration, observation	2 hours
Colloquy	Checking accumulated knowledge	1 hour
8.3. PROJECT **Number of hours - 14**		
Choosing the project theme The content of the project	Exercise, problem solving, heuristic conversation, explanation. Realization of the project	14 hours
Introductory notions necessary for the realization of the project Elements of technological engineering		
Establishing the technological flow Material balance calculation		
Notions related to uses used on the technological flow of obtaining dairy products		
Sketch of the location of the designed unit		
Project presentation		

Compulsory bibliography:

1. Jimborean, Mirela Anamaria şi Ţibulcă, D, 2006, Tehnologia de fabricare a brânzeturilor, Ed. Risoprint, Cluj-Napoca.
2. Ţibulcă, D şi Jimborean, Mirela Anamaria 2008, Tehnologia de obţinere a produselor lactate, Editura Risoprint, Cluj-Napoca
3. Mirela Anamaria Jimborean şi Dorin Ţibulcă, 2013, Tehnologia produselor lactate – îndrumător de lucrări practice, Editura Risoprint, Cluj-Napoca
4. Jimborean, Mirela Anamaria şi Ţibulcă, D, 2016, Procesarea laptelui, partea a II-a, Ed. Risoprint, Cluj-Napoca.

Optional bibliography:

1. Banu, C. şi Vizireanu Camelia, 1998, Procesarea industrială a laptelui, Ed. Tehnică, Bucureşti.
2. Costin, G. şi colab., (2003), Ştiinţa şi ingineria fabricării brânzeturilor, Editura Academica, Galaţi.
3. Ţibulcă, D. şi Mirela Jimborean, 2003, Fabricarea produselor lactate şi a brânzeturilor, Editura AcademicPres, Cluj-Napoca.
4. Ţibulcă, D şi Jimborean, Mirela Anamaria, 2005, Tehnologia laptelui şi a produselor lactate – îndrumător de lucrări practice, Ed. Risoprint, Cluj-Napoca.

9. Corroborating the course content with the expectations of the epistemic community representatives, of the professional associations and of the relevant employers in the corresponding field

Course content is according with what is done in other universities in the country and abroad. To adapt to market demands, in preparing course description, were taken into consideration advices from graduate students of the Faculty of Food Science and Technology, who are working in the field

10. Assessment

Type of activity	10.1. Assessment criteria	10.2. Assessment methods	10.3. Percentage of the final grade
10.4. Course	Logical and correct application of the acquired notions Assimilation of knowledge	Continuous assessment	50%
10.5. Seminar/Laboratory/Project	Application of knowledge on technology for the production of dried dairy products and cheeses	Colloquy Project presentation	25% 25%
10.6. Minimum performance standards			
Knowledge of the main operations and brief description of the operations in the field of technology for obtaining dried dairy products and the main assortments of cheeses Elaboration and presentation of a project addressing the proposed design themes Obtaining a minimum grade of 5 in the colloquium from the practical works. The final grade is the average between the verification on the way (50%) and the grade from the project (25%) and the colloquium (25%)			

[1] Cycle of studies- choose of the three options: Bachelor/Master/Ph.D.

[2] Discipline status (content)- for the undergraduate level, choose one of the options:- **FD** (fundamental discipline), **BD**

(basic discipline), **CS** (specific disciplines-clinical sciences), **AP** (specific disciplines-animal production), **FH** (specific disciplines-food hygiene), **UO** (disciplines based on the university's options).

[3] Discipline status (compulsoriness)- choose one of the options – **CD** (compulsory discipline) **OD** (optional discipline) **ED** (elective discipline).

[4] One credit is equivalent to 25 hours of study (teaching activities and individual study).

Laboratory work/seminar coordinator
Assoc. Prof. PhD. Mirela Jimborean

Course coordinator
Assoc. Prof. PhD. Dorin Ţibulcă

Filled in on
09.09.2021

Assistant PhD. Delia Michiu

Subject coordinator
Assoc. Prof. PhD. Dorin Ţibulcă

Approved by the Department on 22.09.2021

Head of the Department
Prof. PhD. Sevastiţa Muste

Approved by the Faculty Council on 28.09.2021

Dean
Prof. PhD. Elena Mudura