UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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Nr._____din _____ **Form code USAMV 0701020111**

SUBJECT OUTLINE

1. General data

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca
1.2. Faculty	Faculty of Food Science and Technology
1.3. Department	Technical and soil sciences
1.4. Domain of study	Food engineering
1.5. Level of study[1)]	Bachelor
1.6. Specialization/ Program of study	Technology of agricultural product processing
1.7. Form of teaching	IF

2. Characteristics of the course

2.1. Name of the course	Food Processing Equipment 2							
2.2. Course leader				prof. phD. eng. Sorin Stănilă				
2.3. Coordinator of the laboratory/seminars activity				Lecturer phD. Giorgiana Cătunescu Assistent phD. Simona Chiş				
2.4. Year of study	II	2.5. Semester	**IV**	2.6. Type of Evaluation	Continuous	2.7. Course regime	Content[2]	DD
							Level of complulsory[3]	DI

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

3.1. Number of hours/week– frequency form	4	3.2. of which course	2	3.3. seminar/ laboratory/ project	1/1
3.4. Total hours in the teaching curricula	56	3.5. of which course	28	3.6. seminar/laboratory	28
Distribution of time					
3.4.1. Study based on hand book, notes, bibliography					10
3.4.2. Extra documentation in the library, on specific electronic platforms and on field					10
3.4.3. Prepare the seminars / laboratories / projects, theme, essays, reports, portfolio					10
3.4.4. Tutorial					10
3.4.5. Examination					4
3.4.6. Other activities					-
3.7. Total hours of individual study	44				
3.8. Total hours on semester	100				
3.9. Number of ECTS [4]	4				

4. Pre-conditions (where is the case)

4.1. of curriculum	Unit Operations in Food Processing, Transport Phenomena
4.2. of competences	Students should have basic knowledge of technical drawing, mechanics and electrotechnics

5. Conditions (where is the case)

5.1. of course development	Courses are interactive, students have the possibility to ask questions about the topics of the lectures. Academic discipline is a must during courses. Other activities apart of the lectures are not tolerated. Cellphones have to be shut down.
5.2. of seminar/laboratory/project	

development	During practical training seminars students have to refer to the Seminars Guidelines. Each student will conduct an individual activity using the methods and materials described in the Seminars Guidelines. Academic discipline is a must during seminars.

6. Specific competences gained

Professional competences	C2.1. Description and use of basic concepts, theories and methods in the field of processes and operation of agri-food chain installations C2.2. Explanation and interpretation of basic engineering concepts, methods and models in equipment exploitation issues in the agri-food industry 2-4. Critical analysis, evaluation of the characteristics, performances and limits of some technological processes and equipments in the field of the agri-food industry 2-5. Elaboration of projects related to processes and equipment specific to the agri-food industry
Transversal competences	CT1. Applying strategies of perseverance, rigor, efficiency and responsibility in 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 professional ethics in the food field. CT2. Applying interrelationship techniques within a team; amplifying and refining the empathic capacities of interpersonal communication and assuming specific attributions in carrying out the group activity in order to treat / resolve individual / group conflicts, as well as the optimal time management

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

7.1. Subject general objective	The aim of the present course is to offer students knowledge of food processing equipment. Future food scientists will have an insight in the management food processing equipment. Graduates will have a theoretical basis of the optimal process parameters for some of the most modern food processing equipment.
7.2. Specific objective	The course intends to offer students knowledge on the main types of equipment used in the main branches of food industry. They will know the major parts of food processing equipment and their functioning. Graduates will be able to read and understand process flow-diagrams.

8. Content

8.1.COURSE	Methods of teaching	Observations
Number of hours – 28		
1. Winemaking equipment a. White winemaking equipment b. Red winemaking equipment c. Wine conditioning equipment	Lecture	2 lectures
2. Fruit and vegetable processing equipment a. Fruit and vegetable conditioning, processing and storage equipment b. Fruit juices processing equipment	Lecture	3 lectures
3. Barley malting equipment a. Barley conditioning, steeping, germination and kilning b. Malt deculming equipment	Lecture	2 lectures
4. Brewing equipment		

a. Malt milling equipment b. Mashing-lautering equipment c. Wort filters d. Brewing kettle e. Whirlpools and chillers f. Fermentation and beer maturation equipment g. Beer filters h. Packaging and pasteurization equipment	Lecture	2 lectures
5. Milk processing equipment a. Milk reception, conditioning and filtering equipment b. Milk bactofugation equipment c. Dairy processing equipment d. Cream processing equipment e. Yogurt processing equipment f. Concentrated milk and powder milk processing equipment g. Ice cream processing equipment	Lecture	2 lectures
6. Cereal milling and bakery equipment a. Cereal storage equipment b. Cereal pre-cleaning and cleaning equipment c. Cereal conditioning equipment d. Cereal milling equipment e. Flower sifters and intermediary products cleaning equipment f. Bakery equipment g. Pasta processing equipment	Lecture	3 lectures

8.2. SEMINARS **Number of hours – 14**		
1. Laboratory safety rules 2. Theme and structure of individual project	Laboratory safety rules, interactive presentation of theme and structure of individual project	1 practical training seminars
3. Sugar manufacturing equipment	Interactive presentation of sugar manufacturing equipment: presentation films and USAMV Pilot plants	1 practical training seminar
4. Meat processing equipment	Interactive presentation of meat processing equipment: USAMV Pilot plants	1 practical training seminar
5. Brewing and winemaking equipment	Interactive presentation of brewing and winemaking equipment: USAMV Pilot plants	1 practical training seminar
6. Fruit and vegetable processing equipment	Interactive presentation of sugar manufacturing equipment: presentation films	1 practical training seminar

7. Milk processing equipment	Interactive presentation of milk processing equipment: USAMV Pilot plants	1 practical training seminar
8. Cereal milling and bakery equipment	Interactive presentation of cereal milling and bakery equipment: SC Panemar SRL Jucu and USAMV Pilot plants	1 practical training seminar
8.3. PROJECT **Number of hours – 14** **Describe the components, operation and exploitation of the chosen equipment; compute specific parameters for chosen equipment**	Individual project theme	7 practical training seminars

Compulsory bibliography:

1. *Course notes*
2. *Sorin Stănilă, (2016), Curs de utilaje si instalatii în îndustria Alimentară, vol. 1 si 2; Ed. Risoprint Cluj Napoca;*
3. *Sorin Stănilă, (2013), Utilaje în îndustria Alimentară, Ed. Risoprint Cluj Napoca;*
4. *Sorin Stănilă , Adrian Molnar, Rezistenta Materialelor si Organe de Maşini, 329 pag, Editura Risoprint Cluj Napoca, ISBN 978-973-53-1330-2, 2014;*
5. *Sorin Stănilă, Exploatarea utilajelor din industria alimentara, 399 pag, Ed. AcademicPres, Cluj Napoca, ISBN 978-973-744-360-1, 2014.*
6. *Gherman V., (1997), Utilaje pentru industria alimentară, Edit. Sincron, Cluj Napoca;*
7. *Banu C., ş.a., Manualul inginerului din industria alimentară, vol. I şi vol. II, Editura Tehnică, Bucureşti, 1998;*
8. *Banu C., ş.a., Tratat de inginerie alimentară, vol. I şi vol. II, Editura AGIR, Bucureşti, 2010.*
9. *Cojocaru, C. şi colab. (1998)– Manualul inginerului din industria alimentara, Ed. Tehnică, Bucureşti, Ioancea, L. şi colab (1986)– Maşini şi instalaţii in industria alimentară, Ed. Ceres, Bucureşti*

Facultative bibliography:

1. *Amarfi, Rodica – Economia de energie în industria alimentară, Ed. Tehnica, Bucureşti, 1991*
2. *Amarfi, Rodica – Procesarea minimă atermică şi termică în industria alimentară, Ed. Alma, Galaţi, 1996*
3. *Banu, C-tin si colab. – Tehnologia cărnii şi a subproduselor, EDP, Bucureşti, 1980*
4. *Băcăuanu, Ana – Operaţii şi utilaje în industria chimică şi alimentară, curs Lito, Universitatea Tehnica « Gh. Asachi », Iaşi, 1996*
5. *Iliescu, I. şi colab. – Procese şi utilaje în industria alimentara, EDP, Bucureşti, 1975*
6. *Ioancea, L. si Kathrein, I. – Condiţionarea şi valorificarea superioară a materiilor prime vegetale în scopuri alimentare – Tehnologii şi instalaţii, Ed. Ceres, Bucureşti, 1986*
7. *Jascanu, V. – Aparate şi procese în industria alimentară, Curs litografiat, vol. I si II, Universitatea din Galaţi, 1980*
8. *Răsnescu, I. – Operaţii şi utilaje în industria alimentară, vol I si II, Ed. Tenica, Bucureşti, 1971, 1972*

9. Corroboration of the subject content with the expectations of the epistemic communities` representatives, of the professional associations and representatives employers in the domain

The teaching staff participates to ASIAR assemblies to meets with food industry representatives in order to continuously improve teaching activities and to keep the content of lectures up to date ,

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. Course	Students have to know the main: - winemaking equipment - fruit and vegetable processing equipment - barley malting and brewing equipment - milk processing equipment - cereal milling and bakery equipment - spirits processing equipment	Written exams during the lectures	70%
10.5. Seminar/Laboratory	Students have to: - identify the technology and define the processing	Individual project presentation	30%

	parameters relative to their project theme; - design the process diagram flow; - critically analyze various equipment used to perform their project theme and to choose one; - describe the components, operation and exploitation of the chosen equipment; - compute specific parameters for chosen equipment;		

10.6. Minimal standard of performance

Students have to master the scientific information to an acceptable level. Passing the practical exam and course attendance are compulsory. The final grade is a weighted average of written exams during the lectures, practical and project and must be equal to or greater than 5.

[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 teh 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).

Laboratory work/seminar coordinator
Lecturer phD. Giorgiana Cătunescu

Course coordinator
Prof. phD. eng Sorin Stănilă.

Filled in on
07.09.2021

Assistent phD. Simona Chiş

Subject coordinator
Prof. phD. eng Sorin Stănilă

Head of the Department
Prof. phD. Sevastita Muste

Approved by the
Department on
22.09.2021

Dean
Prof. phD. Elena Mudura

Approved by the Faculty
Council on
22.09.2021