



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	Food Control and Expertise
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. Giorgia Cătunescu Assistent PhD. Simona Chiș				
2.4. Year of study	II	2.5. Semester	4	2.6. Type of Evaluation	Continuous	2.7. Course regime	Content ²	DD
							Level of compulsory 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.
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6. Specific competences gained

P r o f e s s i o n a l c o m p e t e n c e s C o m p e t e n ț e p r o f e s i o n a l e	<p>C2.1. Description and use of basic concepts, theories and methods in the field of processes and operation of agri-food chain installations</p> <p>C2.2. Explanation and interpretation of basic engineering concepts, methods and models in equipment exploitation issues in the agri-food industry</p> <p>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</p> <p>2-5. Elaboration of projects related to processes and equipment specific to the agri-food industry</p>
T r a n s v e r	<p>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.</p> <p>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</p>



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

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

8. Content

8.1.COURSE	Methods of teaching	Observations
<p>Number of hours – 28</p> <p>1. Winemaking equipment</p> <ol style="list-style-type: none"> White winemaking equipment Red winemaking equipment Wine conditioning equipment <p>2. Fruit and vegetable processing equipment</p> <ol style="list-style-type: none"> Fruit and vegetable conditioning, processing and storage equipment Fruit juices processing equipment <p>3. Barley malting equipment</p> <ol style="list-style-type: none"> Barley conditioning, steeping, germination and kilning Malt deculming equipment <p>4. Brewing equipment</p> <ol style="list-style-type: none"> Malt milling equipment Mashing-lautering equipment Wort filters Brewing kettle Whirlpools and chillers Fermentation and beer maturation equipment Beer filters Packaging and pasteurization equipment <p>5. Milk processing equipment</p>	<p>Lecture</p> <p>Lecture</p> <p>Lecture</p> <p>Lecture</p>	<p>2 lectures</p> <p>3 lectures</p> <p>2 lectures</p> <p>2 lectures</p>



f. Concentrated milk and powder milk processing equipment g. Ice cream processing equipment 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	Lecture	3 lectures
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8.2. SEMINARS Number of hours – 14 1. Laboratory safety rules 2. Theme and structure of individual project 3. Sugar manufacturing equipment 4. Meat processing equipment 5. Brewing and winemaking equipment 6. Fruit and vegetable processing equipment 7. Milk processing equipment 8. Cereal milling and bakery equipment	Laboratory safety rules, interactive presentation of theme and structure of individual project Interactive presentation of sugar manufacturing equipment: presentation films and USAMV Pilot plants Interactive presentation of meat processing equipment: USAMV Pilot plants Interactive presentation of brewing and winemaking equipment: USAMV Pilot plants Interactive presentation of sugar manufacturing equipment: presentation films Interactive presentation of milk processing equipment: USAMV Pilot plants Interactive presentation of cereal milling and bakery equipment: SC Panemar SRL Jucu and USAMV Pilot plants	1 practical training seminars 1 practical training seminar 1 practical training seminar 1 practical training seminar 1 practical training seminar 1 practical training seminar
8.3. PROJECT Number of hours – 14	Individual project theme	7 practical training seminars



2. Sorin Stănilă, (2016), *Curs de utilaje și instalații în industria Alimentară*, vol. 1 și 2; Ed. Risoprint Cluj Napoca;
3. Sorin Stănilă, (2013), *Utilaje în industria Alimentară*, Ed. Risoprint Cluj Napoca;
4. Sorin Stănilă, Adrian Molnar, *Rezistența Materialelor și Organe de Mașini*, 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., ș.a., *Manualul inginerului din industria alimentară*, vol. I și vol. II, Editura Tehnică, București, 1998;
8. Banu C., ș.a., *Tratat de inginerie alimentară*, vol. I și vol. II, Editura AGIR, București, 2010.
9. Cojocaru, C. și colab. (1998)– *Manualul inginerului din industria alimentara*, Ed. Tehnică, București, Ioancea, L. și colab (1986)– *Mașini și instalații în industria alimentară*, Ed. Ceres, București

Facultative bibliography:

1. Amarfi, Rodica – *Economia de energie în industria alimentară*, Ed. Tehnica, București, 1991
2. Amarfi, Rodica – *Procesarea minimă atermică și termică în industria alimentară*, Ed. Alma, Galați, 1996
3. Banu, C-tin și colab. – *Tehnologia cărnii și a subproduselor*, EDP, București, 1980
4. Băcăuanu, Ana – *Operații și utilaje în industria chimică și alimentară*, curs Lito, Universitatea Tehnică « Gh. Asachi », Iași, 1996
5. Iliescu, I. și colab. – *Procese și utilaje în industria alimentara*, EDP, București, 1975
6. Ioancea, L. și Kathrein, I. – *Condiționarea și valorificarea superioară a materiilor prime vegetale în scopuri alimentare – Tehnologii și instalații*, Ed. Ceres, București, 1986
7. Jascanu, V. – *Aparate și procese în industria alimentară*, Curs litografiat, vol. I și II, Universitatea din Galați, 1980
8. Răsnescu, I. – *Operații și utilaje în industria alimentară*, vol I și II, Ed. Tenica, București, 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: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - identify the technology and define the processing 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; 	Individual project presentation	30%
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



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22.09.2021

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Approved by the Faculty
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