UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
Calea Mănăştur 3-5, 400372, Cluj-Napoca
Tel: 0264-596.384, Fax: 0264-593.792
www.usamvcluj.ro

Nr._____din _____ **Form code USAMV 0701020104**

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 Science and Soil Science
1.4. Domain of study	Food engineering
1.5. Level of study[1)]	Bachelor
1.6. Specialization/ Program of study	Technology of agricultural products processing
1.7. Form of teaching	IF

2. Characteristics of the course

2.1. Name of the course	Food Processing Equipment 1							
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	**III**	2.6. Type of Evaluation	summative	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	3	3.2. of which course	2	3.3. seminar/ laboratory/ project	1
3.4. Total hours in the teaching curricula	42	3.5 of which course	28	3.6. seminar/laboratory	14
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					20
3.4.4. Tutorial					4
3.4.5. Examination					14
3.4.6. Other activities					-
3.7. Total hours of individual study	58				
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 **Number of hours – 28**	Methods of teaching	Observations
1. Introduction to food processing equipment a. The concept of equipment b. Food equipment materials c. Machine elements: fasteners, shafts, mechanisms, pipes and pipe fittings	Lecture	3 lectures
2. Mechanical transport and storage equipment a. Concept and types of mechanical transport and lifting equipment	Lecture	2 lectures

b. Self-propelled and towed transport equipment c. Discontinuous and continuous mechanical conveyors (belt conveyors, chain conveyors, screw conveyors, bucket conveyors pneumatic conveyor, hydraulic conveyors)		
3. Water supply equipment a. Types of water supply equipment b. Water accumulation equipment c. Determination of water requirements d. Water castles and surge chambers e. Water distribution networks f. Water heating equipment	Lecture	1 lecture
4. Sugar manufacturing equipment a. Beet unloading and storage equipment b. Extraction equipment c. Pulp press and dryers d. Juice clarification equipment e. Juice concentration equipment f. Sugar crystallization equipment g. Molasses washing equipment	Lecture	3 lectures
5. Edible vegetable oil processing equipment a. Oilseeds unloading, storage and conditioning equipment b. Dehulling and hull separation equipment c. Flaking mills, roasters and oilseed expellers d. Crude oil clarification equipment e. Solvent extraction equipment f. Oil refining equipment	Lecture	3 lectures
6. Meat processing equipment a. Slaughter equipment b. Meat processing equipment c. Meat byproducts processing equipment	Lecture	2 lectures

8.2. SEMINARS **Number of hours – 14**		
1. Laboratory safety rules 2. Food equipment materials	- Dialog, interactive presentation of the panels containing material samples	1 practical training seminar
3. Machine elements: fasteners	- 3D projections, interactive presentation of fasteners	1 practical training seminar
4. Machine elements: shafts, bearings, couplings	- 3D projections, interactive presentation of shafts, bearings, couplings	1 practical training seminar
5. Machine elements: transmission, mechanisms	- 3D projections, interactive presentation of transmission, mechanisms	1 practical training seminar
6. Machine elements: pipes and pipe fittings 7. Presentation of a general service station for food equipment	- 3D projections, interactive presentation of pipes, pipe fittings and service station	1 practical training seminar

8. Mechanical transport and storage equipment	- Operating of mechanical transport and storage equipment (teaching demonstration stand) and pneumatic conveyers (auto suction hammer mill stand)	1 practical training seminar
9. Practical exam		1 practical training seminar

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: - materials and machine elements - transport and lifting equipment - water supply equipment - sugar manufacturing equipment - edible vegetable oil processing equipment - meat processing equipment	Written exam	80%
10.5. Seminar/Laboratory	Students have to: - identify, define and classify the main machine elements - describe a general service station for food equipment - identify, define and classify the	Practical exam	20%

	main transport and lifting 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.

[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

Approved by the
Department on
22.09.2021

Head of the Department
Prof. Sevastita Muste, PhD

Approved by the Faculty
Council on
28.09.2021

Dean
Prof. Elena Mudura, PhD