No._____of _____ **USAMV** form 0702020112

COURSE DESCRIPTION

1. General data

1.1. Higher Education Institution	University of Agricultural Sciences and Veterinary Medicine from Cluj-Napoca
1.2. Facultaty	Food Science and Technology
1.3. Departament	Food Engineering
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	Full Time

2. Information on the discipline

2.1. Name of the course	Unit Operation in Food Industry – part 2							
2.2. Course coordinator	Assoc. professor MUNTEAN MIRCEA-VALENTIN							
2.3. Seminar / laboratory/project coordinator	Assoc. professor MUNTEAN MIRCEA-VALENTIN							
2.4. Year of study	II	2.5. Semester	**IV**	2.6. Type of Evaluation	Sumate	2.7. Course regime	Content[2]	DD
							Level of complulsory[3]	DI

3. Total estimated time (teaching hours per semester)

3.1. Hours per week – full time programme	2	of which care: 3.2. lecture	1	3.3. seminar/ laboratory/ project	1
3.4. Total number of hours in the curriculum	28	Of which: 3.5.course	14	3.6.seminar/laboratory	14
Distribution of the 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					9
3.4.4.Tutorials					4
3.4.5.Examination					4
3.4.6. Other activities					
3.7. Total hours of individual study	47				
3.8. Total hours on semester	75				
3.9. Number of credits [4]	3				

4. Prerequisites (is applicable)

4.1. curriculum-related	Physical science, technical drawing, Special mathematics, Unit operation in food industry part 1
4.2. skills-related	The student should have knowledge of Inorganic and organic chemistry, Physical and colloidal chemistry, technical drawing

5. Conditions (if applicable)

5.1. for the lecture	It follows a direct response of the information presented in question and answer from both students and teachers. Academic discipline enforce the time start and end

	of the course. We do not allow any other activities during the lecture, mobile phones are closed .
5.2. for the seminar / laboratory / project	Practical work is compulsory to wear dressing gown, consulting advisor practical work, each student will develop an individual activity with laboratory materials made available and described in practice. Academic discipline is required for the duration of works.

6. Specific competences acquired

Professional competences	C2.1. Description and use of basic concepts, theories and methods in the field of unit operations for process control and operation of agri-food chain facilities. C2.2. Explanation and interpretation of basic engineering concepts, methods and models in equipment exploitation issues in the agri-food industry. C2.3. Application of basic principles and methods within unitary operations for solving engineering and technological problems. C2.4. Critical analysis, evaluation of the characteristics, performances and limits of some technological processes and equipments in the field of the agri-food industry.
Transversal competences	CT1 Apply the strategies of perseverance, rigor, efficiency and responsibility at 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 of norms and values of the code of professional ethics in the food field. CT2 Application of interrelation techniques within a team; amplifying and refining the empathic capacities of interpersonal communication and of assuming specific attributions in carrying out the group activity in order to treat / resolve individual / group conflicts, as well as the optimal time management; CT3 Efficient use of various learning pathways and techniques - training for the acquisition of information from bibliographic and electronic databases both in Romanian and in an international language, as well as assessing the need and usefulness of extrinsic and intrinsic motivations of continuing education ; Coordination of technological activities and processes based on technical specifications; Analysis of the technical solutions necessary to improve the quality of food products and to reduce specific consumption.

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

7.1. Subject general objective	Able to know unit operation of food industry branch of manufacture. Know the devices and equipments that occur transforming raw materials into finished product; Able to know the specific installaion used in food industry branch.
7.2. Specific objective	Able to know and use the latest equipment, methods and measurement systems that are used in heat transfer processes that occur in the processing of agricultural products in specific installations; Have known about the operation of the equipment and facilities in food industry branch, to develop the skills to use the theoretical concepts and principles in addressing practical problems found in operations and the devices used in food industry.

	Analyze and evaluate the characteristics, performance and limitations of processes and technological equipment of the food industry. Know the important factors with which it develops, implements and monitors the technical projects and some new technological; To develop a project specific process or machine food industry using concepts, theories and methods based on food industry field; To solve concrete problems of food science based on an algorithm.

8. Content

8.1. LECTURE **Number of hours – 14**	Methods of teaching	Observations
Distillation. Basic laws of distillation. Mixtures used. Distillation methods and distillation installations.	Lectures	1 lecture = 2 hours
Rectification. Rectification types. Rectification apparatus.	Lectures	1 lecture = 2 hours
Extraction. Extraction Apparatus for solid – liquid extraction. Calculation elements of extraction apparatus.	Lectures	1 lecture = 2 hours
Pasteurisation. Pasteuriser. Calculations elements.	Lectures	1 lecture = 2 hours
High pasteurization. High pasteurization ALPURA plant..**Sterilization.** Sterilisation apparatus. Calculation elements.	Lectures	1 lecture = 2 hours
Drying. Drying method. Drying apparatus. Calculation elements.	Lectures	2 lectures = 4 hours

8.2. PRACTICAL WORK **Number of hours – 14**		
Introduction. Laboratory safety rules. Technical calculation errors, charts and measures of size intervening processes studied in laboratory.	Analysis MSDS and PCC. Using the Technical calculation applications in the study of measurements of the processes occurring in lab.	1 lecture = 2 hours
Analysis of the sieving ranking process of granular materials in the sifting machine.	Making the measurements with experimental laboratory sifting machine.	1 lecture = 2 hours
Analysis of the kinetics of the sifting operation and sifting efficiency of granular materials in sifting machine.	Making the measurements with experimental laboratory apparatus.	1 lecture = 2 hours
Study of heat transfer in stationary state in double-tube uniflow heat exchanger. Study of heat transfer in stationary state in double-tube counter heat exchanger.	Making the measurements with experimental laboratory apparatus.	1 lecture = 2 hours
Study of convective heat transfer in finned tube heat exchanger.	Making the measurements with experimental laboratory apparatus.	1 lecture = 2 hours
Analysis of the drying operation with heat conduction in the dryer cylinder.	Making the measurements with experimental laboratory sifting machine.	1 lecture = 2 hours
Recovery of the absences. Verifying knowledge	Colloquium	1 lecture = 2 hours

Compulsory bibliography:

1. *Muntean, M-V – Operații Unitare în Industria Alimentară, manual didactic,Editura Risoprint, 2015*
2. *Cătunescu Giorgiana, Muntean, M-V – Îndrumător de lucrări practice și aplicații în industria alimentară, Ed. AcademicPres, 2016*
3. *Banu, C-tin si colab. – Manualul inginerului de industrie alimentara, Ed Tehnica, Bucureşti, 1999*
4. *Ioancea, L. şi colab – Maşini şi instalaţii în industria alimentară, Ed. Ceres, Bucureşti, 1986*

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*
5. *Banu, C-tin şi colab – Progrese tehnice, tehnologice şi ştiinţifice în industria alimentară, vol. I, Ed.*
4. *Tehnica, Bucureşti, 1992*
5. *Băcăuanu, Ana – Operaţii şi utilaje în industria chimică şi alimentară, curs Lito, Universitatea Tehnica « Gh. Asachi », Iaşi, 1996*
6. Cojocaru, C. si colab. – Manualul inginerului din industria alimentara, Ed. Tehnica, Bucuresti, 1998
7. Florea, O., Jinescu, G., *Procedee intensive în operaţiile unitare de transfer,* Editura Tehnică, Bucureşti, 1975;
8. GEANKOPLIS, C.J., *Transport processes and unit operations,* Prentice-Hall International, Inc., New Jersey, 1993;
9. *Iliescu, I. şi colab. – Procese şi utilaje în industria alimentara, EDP, Bucureşti, 1975*
10. *Ioancea, L. si Kathrein, I. – Condiţionarea şi valorificarea superioară a materiilor prime vegetale în scopuri alimentare – Tehnologii şi instalaţii, Ed. Ceres, Bucureşti, 1986*
11. *Jascanu, V. – Aparate şi procese în industria alimentară, Curs litografiat, vol. I si II, Universitatea din Galaţi, 1980*
12. Muntean Mircea, Gherman Vasile – Fenomene de transfer – Note de curs si lucrari practice, Ed. AcademicPress 2010
13. *Răsnescu, I. – Operaţii şi utilaje în industria alimentară, vol I si II, Ed. Tehnica, Bucureşti, 1972*
14. RASENESCU,A., *Fenomene de transfer,* Editura Universităţii din Galaţi, 1979;
15. ŞTEFĂNESCU, D., MARINESCU, M., *Transferul de căldură în tehnică - culegere de probleme pentru ingineri,* Editura Tehnică, Bucureşti, 1983;
16. ŞTEFĂNESCU, D., ş.a., *Transfer de căldură şi masă – teorie şi aplicaţii,* Editura Didactică şi Pedagogică, Bucureşti, 1983

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

In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems teachers attend the annual meeting of the Romanian Association of Food Industry Engineers where issues are discussed current and future technologies in Romania and Europe.

10. Assessment

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. Lecture	Knowing the types of unit operations in the food industry studied in semester 2; Knowing compenent parts, installations function, apparatus and tools studied. Knowledge of general concepts concerning unit operations analysis; Knowledge of the factors influencing the food industry specific unit operations;	oral exam	80%
10.5. Seminar/Laboratory	Knowledge of students by the unit operations in the food industry. Knowledge of component parts, operation and use of various devices and equipment in specific food operations studied. Knowing how to determine, processing and interpretation of measurements of the processes simulated in the laboratory with the food industry.	Laboratory Colloquium and attendance course	10% +10 %
10.6. Minimum performance standards			
Mastery of scientific information transmitted through lectures and practical work at an acceptable level. Obtaining the pass mark in colloquium test is the condition of graduation**.**			

[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 25-30 de hours of study (didactical and individual study)

[5] Disciplines: AK- Advanced knowledge, CT- Complementary Training, S- Synthesis

Filled in on
06.09.2021

Laboratory work/seminar coordinator
Assoc. Professor Mircea-Valentin Muntean

Course coordinator
Mircea-Valentin Muntean

Subject coordinator
Assoc. Professor Mircea-Valentin Muntean

Approved by the
Department on
22.09.2021

Head of the Department

Approved by the Faculty
Council on
28.09.2021

Dean
Professor Elena Mudura