

# DISCIPLINE SHEET

## 1. Data about the program

1.1 Superior educational institution	<b>University of Oradea</b>
1.2 Faculty	<b>Environmental protection</b>
1.3 Department	<b>Engineering of food products</b>
1.4 Domain of study	<b>Engineering of food products</b>
1.5 Cycle of studies	<b>License</b>
1.6 Program of studies/Calificarea	<b>Control and Expertise of food products/Engineer</b>

## 2. Data about the discipline

2.1 Name of discipline	UNITARY OPERATIONS IN FOOD INDUSTRY						
2.2 Titular of the course activities	Chief of works doctor engineer URS MARIANA						
2.3 Titular of the seminar/laboratory/project activities	Chief of works doctor engineer URS MARIANA						
2.4 Year of study	<b>II</b>	2.5 Semester	<b>IV</b>	2.6 Type of assessment	<b>Ex.</b>	2.7 Discipline regime	<b>Ob</b>

Ob – obligatory/compulsory; As – associated; Op – optional.

## 3. Total estimated time (semestrial number of hours of didactical activities)

3.1 Number of hours per week	5	From which: 3.2 course	2	3.3 seminar/laborator/yproject	2+1
3.4 Toatl number of hours from the educational/curriculum plan	70	From which: 3.5 course	28	3.6 seminar/laboratory/project	28+14
Distribution of time fund					hours
Study after the book, course support, bibliography, notes					18
Extra documentation in the library, on specialized electronic platforms, out on the open field					16
Preparation of seminars/laboratories, themes, essays, portfolios, reviews					17
Tutoring					0
Examinations					2
Other activities.....					2
<b>3.7 Total hours of individual study</b>	<b>55</b>				
<b>3.9 Total hours per semester</b>	<b>125</b>				
<b>3.10 Number of credits</b>	<b>4+1</b>				

## 4. Preconditions (where it is necessary)

4.1 of curriculum	(Conditioning agents)Physics and transfer phenomena
4.2 of competențe	Devices and measuring and control systems in the food industry

## 5. Conditions (where it is necessary)

5.1. of course on going	<ul style="list-style-type: none"> <li>The students shall not come to the lectures/seminars/laboratories with their mobile phones turned on. Also, we shall not tolerate phone conversations during the course, nor shall we tolerate students who leave the course in order to answer a personal telephone call.</li> <li>The students' delay for the course /seminars/laboratories shall not be tolerated as the delay proves to be disruptive to the educational process.</li> </ul>
5.2. of seminar/laboratory/project on going	<ul style="list-style-type: none"> <li>The dead line for delivering the seminar worksheets is established by the titular on mutual agreement with the students. Any delay request shall be accepted only on the basis of very objective reasons. If any laboratory worksheet is to be handed in later than the previously</li> </ul>

	established dead line the worksheets shall be downgraded 1 point for each day of delay.
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<b>6. Accumulated specific competence</b>	
Professional competences	<p>C2. Running the general engineering processes, exploitation of installations and of the food industry out fit.</p> <p>C2.1. Description and use of the concepts, theories and basic methods from the domain of processes and exploitation of installations from the food industry chain</p> <p>C3. Supervising, running, analysing and designing the food technologies from raw materials until the finite products.</p>
Transversal competences	

### 7. Discipline objectives (those outcoming from the accumulated specific competence grid)

7.1 General objective of the discipline	<ul style="list-style-type: none"> <li>The discipline of unitary operations in food industry has as an aim to present aspects related to those unitary operations that are at the basis of food technologies, on the basis of which one can conceive a technology and a scheme of operations.</li> </ul>
7.2 Specific objectives	<ul style="list-style-type: none"> <li>For each unitary operation there are referrences to: the factors that intervene, the scientific principles on which the operation is based or which coordinate the main factors, the correlation links which establish the value of the sizes necessary for the technological design, representative types of devices.</li> </ul>

### 8. Contents\*

8.1 Course	Teaching methods	No. of hours/Observations
1.Classification of operations in food industry. Mixing, its definition, factors which influence the mixing process, mixing procedures, utilization in food industry.	Interactive lecture with video projection	2
2.Sedimentation in a field of gravitational forces, factors which influence sedimentation. S-L, L-L, G-S sedimentation machines.	Interactive lecture with video projection	2
3.Filtration, principle of filtration, factors which influence the filtration. Types of filters.	Interactive lecture with video projection	2
4.Centrifugation. Factors influencing centrifugation.	Interactive lecture with video projection	2
5.Extraction. Factors influencing extraction. Diffusion. Operations based on diffusion.	Interactive lecture with video projection	2
6.Evaporation concentration. Factors which influence evaporation concentration. Evaporation processes.	Interactive lecture with video projection	2
7.Sterilization – pasteurization. Defining the operations, factors that influence the operations.	Interactive lecture with video projection	2
8.Refrigeration. General principles of the refrigeration.	Interactive lecture with	2

Systems of refrigerations.	video projection	
9.Freezing. General principles of freezing Systems of freezing.	Interactive lecture with video projection	2
10.Thawing. Thawing methods.	Interactive lecture with video projection	2
11.Drying. Definition of operation, conditions of realization, factors which influence drying, types of dryers. Utilization of the drying operation in food industry.	Interactive lecture with video projection	2
12.Distillation. Steam training. Rectification.	Interactive lecture with video projection	2
13.Crystallization. Factors influencing the of crystallization. Crystallization processes.	Interactive lecture with video projection	2
14.Crystallization systems.	Interactive lecture with video projection	2
8.2 Seminar	Teaching methods	No. of hours / Observations
8.3 Laboratory	Teaching methods	No. of hours/ Observations
1.Study of the mixing operation. Mixing efficiency. Construction of mixers. Types of mixers.	Demonstration, practical application	2
2.Study of the sedimentation operation. Gravitational force sedimentation apparatus.	Demonstration, practical application	2
3.Study of the filtration operation. Filter materials. Types of leaks.	Demonstration, practical application	2
4.Crushing and fractionation of solids.	Demonstration, practical application	2
5.Absorption. Factors influencing absorption. Adsorption. Factors influencing adsorption	Demonstration, practical application	2
6.Operations of heat exchange. Heat sources. Heat exchangers.	Demonstration, practical application	2
7.Condensation. Condensation methods. Types of condensers.	Demonstration, practical application	2
8.Conditioning operations: sorting, washing, removal of kernels, division.	Demonstration, practical application	2
9.Sources of cold. Cold production methods.	Demonstration, practical application	2
10.Applications of cold in the food industry.	Demonstration, practical application	2
11.Study of the drying operation. Drying mechanism.	Demonstration, practical application	2
12.Study of the pressing operation .	Demonstration, practical application	2
13.Study of the discontinuous differential distillation operation.	Demonstration, practical application	2
14.Study of the crystallization operation.	Demonstration, practical application	2
8.4Project		
Materials used in agri-food technologies I	Display	1
Materials used in agri-food technologies II	Display	1
Transfer phenomena - theoretical notions. Ways of representing the technological process.	Display	1

Material balance. Types of material balance	Display	1
Preparation of the balance of materials.	Display	1
Representation and verification of material balances	Display	1
Energy balance. Classification of energy balances.	Display	1
Calculations at operations pasteurization – sterilization- Vegetables.	Calculations	1
Calculations at operations pasteurization – sterilization- Fruits.	Calculations	1
Calculations for vegetable and fruit concentrations.	Calculations	1
Calculations at the concentration operation with added sugar.	Calculations	1
Calculations at the drying operation.	Calculations	1
Calculations at the conservation operation using antiseptics and biochemical.	Calculations	1
Project presentation	Display	1
<b>Bibliografy</b> <ol style="list-style-type: none"> <li>1. Constantin Banu-Tratat de inginerie alimentară, Vol I, Editura Agir București, 2007</li> <li>2. I.Jianu, Delia Dumbravă, D.Dronca, T.Trască – Principii și tehnici de procesare și conservare a produselor agroalimentare. Determinări. Calcule Tehnologice, Timișoara, 1997</li> <li>3. Rășenescu I.-Operații și utilaje în industria alimentară Vol I-II, Editura Tehnică București 1972</li> <li>4. Valentin Nedeff-Mașini și instalații pentru industria alimentară, Vol I-II-III, Bacău 1997</li> <li>5. Academia Română – Dicționar explicativ pentru științe exacte, Industrie alimentară, IAL, Operațiuni unitare, Editura Academiei Române, 2004</li> <li>6. Mihaela Botiș Nistoran, Liliana Tulcan, Dinu Gubencu, Remus Boboescu – Bazele proceselor agroalimentare, Editura de Vest, Timișoara, 2008</li> <li>7. Alexandru Rinovetz – Operații unitare în industria chimică, Partea I, Editura Agroprint, Timișoara, 2009</li> </ol>		

\* The number of hours allocated for each course/seminar/laboratory shall be mentioned in detail for the period of the 14 weeks of each semester of the university year.

**9. Corroboration of the discipline contents with the expectations of the epistemic community representatives, of the professional associations and representative employers from the domain afferent to the program**

<ul style="list-style-type: none"> <li>▪ Students shall acquire the necessary knowledge related to the unitary operations applied in technological processes of producing food products.</li> <li>▪ Students shall acquire the necessary skills to actually perform the activities through which they can determine, qualitatively and quantitatively the obtained fruits.</li> </ul>
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**10. Assessment**

Type of activity	10.1 Assessment criteria	10.2 Assessment methods	10.3 Percentage from the final grade
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10.4 Course	For grade 5 – knowing 50% of the school matter		70
	For grade 6 – knowing 60% of the school matter		
	For grade 7 – knowing 70% of the school matter		
	For grade 8 – knowing 80% of the school matter		
	For grade 9 – knowing 90% of the school matter		
	For grade 10 – knowing 100% of the school matter (the student makes proof that s/he has read the presented bibliographical material)		
10.5 Seminar	For grade 5 – the student answers correctly at 50% of the questions		30
	For grade 6 – the student answers correctly at 60% of the questions		
	For grade 7 – the student answers correctly at 70% of the questions		
	For grade 8 – the student answers correctly at 0% of the questions		
	For grade 9 – the student answers correctly at 90% of the questions		
	For grade 10 – the student answers correctly at 100% of the questions		
10.7 Project	For grade 5 – the student answers correctly at 50% of the questions	Summative assessment/evaluation – sustaining and arguing technical solutions on the basis of the written project – oral evaluation/examination	100
	For grade 6 – the student answers correctly at 60% of the questions		
	For grade 7 – the student answers correctly 70% of the questions		
	For grade 8 – the student answers correctly 0% of the questions		
	For grade 9 – the student answers correctly 90% of the questions		
	For grade 10 – the student answers correctly 100% of the questions		
10.8 Minimum standard of performance			
Understanding the theoretical notions specific to the food industry and applying them practically , realization of a study on different themes concerning the food industry domain.			

Date of completioni      Signature of the course titular\*\*

Signature of the  
seminr/laboratory/project titular\*\*

01.10.2020

Chief of works dr. engineer. Urs Mariana  
mariana\_mediu@yahoo.com

Chief of works dr. engineer Urs Mariana

Date of approval in the department

Signature of the department manager

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Chief of works dr. engineer, Timar Adrian Vasile

Signature of the Dean  
University professor, doctor engineer,.  
Cheregi Ioan