

## SUBJECT DESCRIPTION

### 1. Information on the study programme

1.1 Academic institution	<b>UNIVERSITY OF ORADEA</b>
1.2 Faculty	<b>FACULTY OF ENVIRONMENTAL PROTECTION</b>
1.3 Department	<b>ENGINEERING OF FOOD PRODUCTS</b>
1.4 Field of study	<b>CONTROL AND EXPERTISE OF FOOD PRODUCTS</b>
1.5 Cycle of study	<b>BACHELOR</b>
1.6 Study programme/Qualification	<b>CONTROL AND EXPERTISE OF FOOD PRODUCTS/ ENGINEER</b>

### 2. Information on the discipline

2.1 Name of discipline	<b>CHEMISTRY III -BIOCHEMISTRY</b>						
2.2 Course holder	Associate prof. dr. Purcărea Cornelia						
2.3 Seminar/Laboratory/Project holder	Associate prof. dr. Purcărea Cornelia						
2.4 Year of study	I	2.5 Semester	2	2.6 Type of evaluation	E	2.7 Regime of discipline	C

(C) Compulsory; (O) Optional; (E) Elective

### 3. Total estimate time (hours per semester of didactic activities)

3.1 Number of hours per week	4	out of which: 3.2 course	2	out of which 3.3 seminar/laboratory/project	2
3.4 Total hours in the curriculum	56	out of which: 3.5 course	28	out of which 3.6 seminar/laboratory/project	28
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					30
Additional documentation in the library/ on specialised electronic platforms and in the field					20
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					10
Tutorship					7
Examinations					2
Other activities.....					
<b>3.7 Total hours of individual study</b>	<b>64</b>				
<b>3.9 Total hours per semester</b>	<b>120</b>				
<b>3.10 Number of credits</b>	<b>5</b>				

### 4. Prerequisites (where appropriate)

4.1 curriculum	Notions of organic chemistry and structural biochemistry
4.2 competences	

### 5. Conditions (where appropriate)

5.1. related to course	Classroom 122	Faculty for Environmental Protection
5.2. related to seminar/laboratory/ project	Laboratory 009	Faculty for Environmental Protection

6. Specific competences acquired	
Professional competences	<p><b>C1. Operation of equipment in food production units.</b>  C1.1. Description and use of basic concepts, theories and methods for food engineering on the structure and properties of food components and contaminants, the transformations that they undergo during processing, the devices, equipment and technologies in food industry (knowledge provided by disciplines such as: general, inorganic, organic chemistry, food chemistry, biophysics, biochemistry, physical and colloidal chemistry, devices, equipment and technologies in the food industry)  C1.3. Application of basic principles and methods in food engineering to solve technological problems related to the operation of the food industry equipment.</p> <p><b>C4. Quality control of food, raw and auxiliary materials.</b>  C4.1. Description and use of basic concepts, theories and methods used in quality control of food products, on the chemistry of compounds that determine food quality, the transformations that they undergo during processing, transport and storage, the apparatus and methods for determining and analyzing of these compounds (knowledge provided by the disciplines of general, inorganic, organic chemistry, food chemistry, biochemistry, analytical chemistry, instrumental analysis, microbiology, hygiene, food additives, food quality control)</p> <p><b>C5. Expertise of food, raw and auxiliary materials.</b>  C5.1. Description and use of basic concepts, theories and methods used in food expertise related to chemical compounds that determine the quality and traceability of food products, the transformations that they undergo during processing, transport and storage, the apparatus and methods for determining and analysis of these compounds and the relevant legislation (knowledge provided by the disciplines of general, inorganic, organic chemistry, food chemistry, biochemistry, analytical chemistry, instrumental analysis, microbiology, hygiene, food additives, food quality control)</p>

## 7. Objectives of discipline (coming from the specific competences acquired)

7.1 General objective	provides students knowledge of the main component of living matter in general and food and agricultural products in particular, knowledge of the main transformations of food during processing, storage, and transport and their metabolism in the body.
7.2 Specific objectives	knowledge of how to organize an agro biochemistry laboratory, preparing common solutions, knowledge of qualitative and quantitative analysis of the main components of food products.

## 8. Content\*/

8.1 Course	Methods of teaching	No. of hours/Remarks
1-2 Nutrients in food composition	ppt presentation	4
3.Enzymes and their role in organisme. Clasification. Mecanisme Factors influencing enzyme activities. Enzymes in food technology	ppt presentation	2
4.Vitamines: nomenclature, clasification. Vitamines in food	ppt presentation	2
5.Hormones. Phytohormones. Pigments.. Food Coloring (dye) Byproducts of metabolism in food	ppt presentation	2
6. Metabolic processes. Anabolism. Catabolism. Carbohydrates anabolism . Chemosynthesis. Photosynthesis.	ppt presentation	2.
7.Carbohydrates catabolism. Glicolizis. Krebs cycle. Pentose phosphate pathway.	ppt presentation	2.
8. Aerobic and anaerobic fermentations	ppt presentation	2.
9. Biochemical changes of carbohydrates during storage and food production	ppt presentation	2

10. Lipides metabolism .	ppt presentation	2
11 Biochemical changes of lipids during storage and food production	ppt presentation	2
12. Proteins and aminoacids metabolism. Metabolic interrelations.	ppt presentation	2
13 Biochemical changes of protein, enzymes and vitamins during storage and food production, depozitării și transportului	ppt presentation	2.
14. Living food, dead food.	ppt presentation	2.
1.I.F.Dumitru - Biochimie - Editura Didactică și Pedagogică, București 1980. 2.I.F.Dumitru,Dana Iordăchescu – Introducere în enzimologie- Editura Medicală, București , 1981. 3.G.Neamțu - Biochimie alimentară- Ed.Ceres, București, 1997 4.C.Purcărea – Biochimie agroalimentară. Edit.Univ. Oradea, 2005. 5.C.Socaciu - Chimie alimentelor- Ed.Academic.Press, Cluj-Napoca, 2003.		
8.2 Seminar	Methods of teaching	No. of hours/ Remarks
8.3 Laboratory		
1. General laboratory safety rules and regulations for biochemistry laboratories. How to organize an agro biochemistry laboratory	signing the work safety training table	2
2.Qualitative and quantitative analyses in food biochemistry	Application. experiments, ppt	2
3. Quantitative determination of carbohydrates in food. Schreiff method	Application. experiments, ppt	2
4.Lactose determination from milk.Refractometric determination of total sugar from honey	Aplicații, experimente	2
5. Lipids. Determining of various indices characteristics for lipids	Application. experiments,	2
6. Gerber and Soxhlet methods methods for fat determination	Video, ppt	2
7. Obtaining the proteic extracts. Identification of aminoacids by TLC	Application. experiments, ppt	2
8. Determination of protein in milk – Sorensen methods. Determination of casein in milk	Application. experiments, ppt	2
9. Spectrophotometric determination of protein in milk – Biuret method. Determination of protein- Kjeldahl method.	Application. experiments, ppt	2
10. Highlighting enzymes. Influence of pH and temperature on catalase activity	Aplicații, experimente,	2
11. Vitamins. Identification of some vitamins. Determination of vitamin C in milk	Application. experiments,	2
12. Vitamins. Determination of vitamin C in juice, fruits and vegetables	Application. experiments,	2
13. Identification of chlorophyll pigments by TLC. Spectrophotometric determination of chlorophyll pigments.	Application. experiments,	2
14. Knowledge verification	Determination and calculation of some parameters	2
8.4 Project		
References Dana Iordăchescu, I.F.Dumitru-Biochimie practică – Tipografia Universității, București, 1980.		

- 2.G.Neamțu - Lucrări Practice de biochimie alimentară- Tipo Agronomia, Cluj-Napoca, 1997
- 3.N.Popescu, S.Meica - Noțiuni și elemente practice de chimie analitică sanitar veterinară, Ed.Diacon Coresi, București, 1993.
- 4.Cornelia Purcărea - Biochimie alimentară practică, Ed.Univ.Oradea,2003.
- 5..C.Socaciu, O.Bobiș - Caiet de lucrări practice, Chimia alimentelor, Ed. Academic Press, Cluj-Napoca, 2003.

\* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

**9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme**

- The discipline provides the specialists for the food control laboratories, on the technological flow or in accredited laboratories for the food control, but also for the control bodies - DSV, DSP, OPC

**10. Evaluation**

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	For grade 5 – knowledge of the material 50% For grade 10 – knowledge of the material in 100% (the student presented the evidence of studied references )	Presentation of a topic from agrifood biochemistry  Summative Evaluation - Final exam - written or oral	10%  70%
10.5 Seminar	-	-	-
10.6 Laboratory	Test with 5 questions at the end of every laboratory activity	Continuous assessment  Evaluation of laboratory	10%  10%
10.7 Project	-	-	-
10.8 Minimum standard of performance			
<ul style="list-style-type: none"> <li>• Knowledge of the main component of food and agricultural products, knowledge of the main biochemical transformations in food during processing, storage, and transport . To know the Chemical composition of the main food groups</li> <li>• Prepare usual solutions, to know the qualitative and quantitative analysis technique, for the main components of foods</li> </ul>			

Date of completion

Signature of course holder\*\*

Signature of seminar  
laboratory/project holder \*\*

01.02..2019

Ass. prof.dr. Purcărea Cornelia  
cpurcare@uoradea.ro

Ass.prof.dr. Purcărea Cornelia  
cpurcare@uoradea.ro

Date of approval in the department

Signature of the Head of Department  
Lecturer Dr ing.  
Adrian Timar  
atimar@uoradea.ro

Dean signature  
Prof univ dr. Chereji Ioan  
ichereji@uoradea.ro

\*\* - Name, first name, academic degree and contact details (e-mail, web page, etc) will be specified.