



No. _____ / _____

Form code USAMV 0101010102

SUBJECT OUTLINE**1. Information on the programme**

1.1. Higher education institution	University of Agricultural Sciences and Veterinary Medicine Cluj-Napoca
1.2. Faculty	Agriculture
1.3. Department	Department of Environmental and Plant Protection
1.4. Domain of study	Agronomy
1.5. Level of study ¹⁾	Bachelor
1.6. Specialization	Agriculture
1.7. Form of education	IF

2. Information on the discipline

2.1. Discipline name	Biochemistry								
2.2. Course coordinator	Prof. PhD DULF FRANCISC VASILE								
2.3. Seminar/ laboratory/ project coordinator	Prof. PhD DULF FRANCISC VASILE								
2.4. Year of study	I	2.5. Semester	I	2.6. Evaluation type	Continuous	2.7. Course regime	Content ²	DF	
								Compulsory level ³	DI

3. Total estimated time (hours/semester for the teaching activities)

3.1. Hours per week – full time programme	4	out of which: 3.2. course	2	3.3. seminar/ laboratory/ project	2
3.4. Total number of hours in the curriculum	56	out of which: 3.5. course	28	3.6. seminar/laboratory	28
Distribution of time					hrs.
3.4.1. Study based on hand book, notes, bibliography					20
3.4.2. Extra documentation in library, on specific electronic platforms and on field					15
3.4.3. Preparation of seminars / laboratories / projects, essays, reports, portfolios					4
3.4.4. Tutorial					10
3.4.5. Examination					
3.4.6. Other activities					
3.7. Total hours of individual study	64				
3.8. Total hours on semester	120				
3.9. Number of credits ⁴	5				

4. Pre-conditions (where relevant)

4.1. for curriculum	Organic Chemistry
4.2. for competences	The student must have knowledge regarding general chemistry and organic chemistry from highschool order to understand important food chemistry principles

5. Conditions (where relevant)

5.1. for course	The course is interactive; students can ask questions regarding the content of the exposure. Academic discipline enforces time start and end of the course. Any other activities are forbidden during course, the mobile phones must be switched off.
5.2. for seminar/laboratory/project	In the laboratory students must consult the practical guide, every student will perform individual activity using the laboratory equipment which is described in the practical guide. During the practical activities the academic discipline must be maintained.

6. Specific competences acquired

Professional competences	<p>-Description and use of concepts, theories and basic methods used in quality control of food products; the concepts are referring to the chemical compounds that assure the product quality, their transformation during processing, transportation and storage, the equipment and the quantification methods used for determining these compounds</p> <p>-Description and use of concepts, theories and methods of basic Food science (defined in multidisciplinary terms), on the structure, properties and transformations of food compounds and contaminants throughout the food chain</p> <p>-Explanation and interpretation of concepts, processes, models and methods of food science, using basic knowledge on the composition, structure, properties and transformations of food compounds and their interaction with other systems throughout the food chain</p>
Transversal competences	<p>- Applying strategies like perseverance, rigor, efficiency and responsibility in work, punctuality and personal assumption of responsibility for business results, creativity, common sense, analytical and critical thinking, problem solving and so on, based on principles, norms and code values applied for ethics in food.</p> <p>- Applying networking techniques within a team; amplification and shaping of empathic capacities of interpersonal communication and ownership of specific tasks in this activity group for treatment / conflict solving individual / group, and optimal management of time.</p>

7. Objectives of the course (as a result of the specific competences acquired)

7.1. . General objectives	Assimilation of fundamental concepts of biochemistry required for engineers in the food industry in order to understand and learn other disciplines (nutrition, toxicology, food control, etc.); knowledge of organic compounds involved in the proper functioning of plant and animal organisms.
7.2. Specific objectives	<p>Food Biochemistry course aims to prepare students for senior years, help them to achieve an understanding of the chemical changes that take place with food components during processing and storage.</p> <p>The study of biochemistry is necessary for arming students with the knowledge and practical skills on the handling of laboratory tools, identification or determination of chemical compounds based on its content.</p>

8. Content

8.1. COURSE Number of hours – 28	Teaching methods	Observation
<p>Biochemistry - Definition & Meaning, Branches, Importance</p> <p>The chemical composition of vegetable and animal organisms</p> <p>Carbohydrates: nomenclature, classification, properties, uses in the food industry. Monosaccharides. Structure, properties, role. Disaccharides. Structure, properties, role. Polysaccharides: structure, properties, role.</p> <p>Lipids: General characterisation. Fatty acids and alcohols components. Simple Lipids: Glycerides, cerides, turosterides: structure, physical and chemical properties, uses in industry, role. Complex lipids :gliceroloipids, glycerophospholipids, sulfolipids: structure, physical and chemical properties, role</p> <p>Protides:Introduction; Aminoacids (properties, classification, representatives) . Peptide. Proteins (properties, structure) globular and fibrillar proteins; Proteide (properties, representatives).Nucleoproteide (structure and significance) .</p> <p>Enzymes.</p> <p>Nucleic acids. General characterisation and biological role. Pyrimidine and purine nitrogenous bases. Nucleosides and nucleotides. Deoxyribonucleic acid (DNA) -structure, properties, role. Ribonucleic acid (RNA)-types, structure.</p> <p>Vitamins. General characterization, classification, role, Fat-soluble vitamins (A, D, E, F) - structure, function, biochemical role. Water soluble vitamins (B1, B3, B6, C, PP, pantothenic acid, folic and folinic) - structure, function, biochemical role.</p>	<p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p> <p>Lectures</p>	<p>1 Lecture</p> <p>1 Lecture</p> <p>3 Lectures</p> <p>2 Lectures</p> <p>3 Lectures</p> <p>1 Lecture</p> <p>1 Lecture</p> <p>2 Lectures</p>
8.2. PRACTICAL WORK Number of hours – 28	Teaching methods	Observation
<p>Laboratory safety rules. Characteristic reactions of carbohydrates.</p> <p>Characteristic reactions of lipids</p> <p>Characteristic reactions of protides</p> <p>Enzymes. Enzymes utilization in food industry</p>	<p>Theoretical presentation of practical works.Practical works.</p> <p>Theoretical presentation of practical works. Practical works.</p> <p>Theoretical presentation of practical works. Practical works.</p> <p>Theoretical presentation of practical works. Practical works.</p>	<p>3 lab works (2 hours/work)</p> <p>3 lab works</p> <p>3 lab works</p> <p>2 lab works</p>

Identification reactions for lipo and hydrosoluble vitamins.	Theoretical presentation of practical works. Practical works.	2 lab works
Knowledge checks	Examination	2 h
Compulsory bibliography 1. G. Neamțu - "Biochimie Alimentara" - Edit. Ceres, București, 1997 2. Andreea Stănilă, Carmen Socaciu, - „Biochimia alimentelor- Lucrări practice și teste”, Editura Academic Press, Cluj-Napoca, 2004 3. Andreea Stănilă – Analiza compusilor bioactivi din alimente; Ed.Academic Press Cluj-Napoca; 2013 4. . Andreea Stanila – Biochimie Structurala; Ed. AcademicPress Cluj-Napoca, 2013		
Facultative bibliography: 1) L.Stryer –“ Biochemistry ”-fourth edition, W.H.Freeman & Co., New York, 1995 2) A.Lehninger, D.Nelson, M.M.Cox –“ Principles of Biochemistry ”, Worth Publ.N.Y.,1993		

9. Corroboration of the subject content with the expectations of the epistemic community representatives, of the professional associations and representative employers in the domain

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 Association of Specialists in Food Industry of Romania as well as business meetings with members of food industry.

10. Evaluation

Type of activity	10.1. Evaluation criteria	10.2. Evaluation methods	10.3. Percent of the final grade
10.4. Course	Identify the main classes of bioactives compounds. Knowledge of specific reaction for biochimic compounds Knowing the properties of classes of organic compounds found in the food industry	Continuous	75%
10.5. Seminar/Laboratory	Theoretical and practical knowledge of the methods of analysis used in the chemistry lab. Troubleshooting stoichiometric with practical applicability (concentration, purity, yield).	Periodic evaluation / colloquy	25%

10.6. Minimal standard of performance

Mastering scientific information conveyed through lectures and practical work at an acceptable level. Obtaining the pass mark in continuous assessment is the condition of graduation.

- ¹ Level of study - to be chosen one of the following - Bachelor/Master
- ² Course regime (content) - for Bachelor level it will be chosen one of the following - **FdS** (fundamental subject), **BS** (basic subject), **SS** (specific subject), **CS** (complementary subject).
- ³ Course regime (compulsory level) - to be chosen one of the following - **CsS** (compulsory subject); **OS** (optional subject) **FS** (facultative subject).
- ⁴ One credit is equivalent with 25-30 hours of study (didactic and individual study).

Filled in on
04.09.2019

Course coordinator
Prof. PhD DULF FRANCISC V.

Laboratory work/seminar coordinator
Prof. PhD DULF FRANCISC V.

Approved by the
department on
05.09.2019

Head of the Department
Prof. Univ. Dr. Ing. IOAN OROIAN