**Annex 6**

# DISCIPLINE DESCRIPTION

**1. Information on the study programme**

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| 1.1 Academic institution | **UNIVERSITY OF ORADEA** |
| 1.2 Faculty | **FACULTY OF ENVIRONMENTAL PROTECTION** |
| 1.3 Department | **ENGINEERING OF FOOD PRODUCTS** |
| 1.4 Field of study | **CONTROL AND EXPERTISE OF FOOD PRODUCTS** |
| 1.5 Cycle of study | **BACHELOR/MASTER** |
| 1.6 Study programme/Qualification | **PROCESSING TECHNOLOGY OF AGRICULTURAL PRODUCTS** |

**2. Information on the discipline**

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|---|---|---|---|---|---|---|---|
| 2.1 Name of discipline | | | **ORGANIC CHEMISTRY** | | | | |
| 2.2 Course holder | | | Simona Ioana VICAS | | | | |
| 2.3 Seminar/Laboratory/Project holder | | | Cristina ROSAN | | | | |
| 2.4 Year of study | I | 2.5 Semester | I | 2.6 Type of evaluation | Ex | 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 | 3 | out of which: 3.2 course | 2 | out of which 3.3 seminar/laboratory/project | 1 |
| 3.4 Total hours in the curriculum | 42 | out of which: 3.5 course | 28 | out of which 3.6 seminar/laboratory/project | 14 |
| Time allotment | | | | | hours |
| Study assisted by manual, course support, bibliography and notes | | | | | 25 |
| Additional documentation in the library/ on specialised electronic platforms and in the field | | | | | 28 |
| Preparation of seminars/laboratories/ topics/reports, portfolios and essays | | | | | 20 |
| Tutorship | | | | | |
| Examinations | | | | | 10 |
| Other activities..... | | | | | |
| **3.7 Total hours of individual study** | **83** | | | | |
| **3.9 Total hours per semester** | **125** | | | | |
| **3.10 Number of credits** | **5** | | | | |

**4. Prerequisites** (where appropriate)

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| 4.1 curriculum | Knowledge of organic chemistry from high school |
| 4.2 competences | Write chemical formulas, recognition and handling of glassware, measuring volumes, calculate the concentration of solutions |

**5. Conditions** (where appropriate)

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| 5.1. related to course | A classroom, equipped with laptop, projector and appropriate software |
| 5.2. related to seminar/laboratory/ project | A laboratory, equipped with laboratory equipment, reagents, solutions, glassware, equipment, projector, interactive chemistry lessons on CD |

| **6. Specific competences acquired** | |
|---|---|
| Professional competences | C1.1. Description of the scientific foundations and acquired methods for the disciplines of chemistry (inorganic, analytical, organic and physical chemistry), biochemistry, instrumental analysis, in order to get a correct management of a technological process in the food industry<br>C2.2. To identify methods for measuring and estimating the quality of foods and assurance system and quality control of food<br>C3.3. Application of basic principles in food and theoretical knowledge transfer in productive practice<br>C4.2. Explanation the concept of quality management for the correct application in food processing units<br>C5.1. Identification of specialized terminology on the quality, standards and food hygiene in order to collaborate and cooperate with the authorities responsible for food safety and quality |
| Transversal competences | |

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

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| 7.1 General objective | Students will learn the fundamental theoretical organic chemistry, the main classes of organic compounds (hydrocarbons, hydroxyl, carbonyl, carboxylic compounds, compounds with nitrogen) and the basic structures of biomolecules (carbohydrates, lipids, proteins and nucleic acids). The course presents the fundamental discipline necessary for other specialist courses and be a necessity of first importance for students of Food Industry Profiles (TPPA). Course contents and practical works are so organized as to be specific to the field of control engineering and processing agricultural products. |
| 7.2 Specific objectives | Assimilation of theoretical issues related to the structure of organic compounds, electronic effects, reaction mechanisms, |

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| | isomers.<br>Deepening of theoretical aspects with practical applications that include the descriptive presentation of the main classes of organic compounds.<br>Students will learn the knowledge on the structure, properties and applications in the food industry the main biomolecules (carbohydrates, lipids, proteins, nucleic acids) |

**8. Content*/**

| 8.1 Course | Methods of teaching | No. of hours/Remarks |
|---|---|---|
| **Introduction.** The structure of organic compounds. Atomic orbitals. Hybridization. Molecular orbitals. Covalent Bonds. | Exposure, discussion, PowerPoint presentations | 2 |
| **Electronic effects.** Inductive effect. Electromeric effect.**An introduction to organic reactions and their mechanisms.** Substitution. Addition. Elimination. Transpozition. **Isomerism** (geometrical and optic). | Exposure, discussion, PowerPoint presentations | 2 |
| **Hydrocarbons. Alkanes. Alkenes.** | Exposure, discussion, PowerPoint presentations | 2 |
| **Hydrocarbons. Alkynes. Arenes.** The polycyclic aromatic hydrocarbons (PAHs) in food. | | 2 |
| **Hydroxylic compounds**. Alcohols. Phenols. Polyphenolic compounds. Applications in the food industry | Exposure, discussion, PowerPoint presentations | 2 |
| **Carbonyl compounds**. Aldehydes. Ketones. Applications in the food industry. | Exposure, discussion, PowerPoint presentations | 2 |
| **Carboxylic acid compounds** (lactic acid, citric acid, tartaric acid, malic acid, fumaric acid) and its derivatives. Applications in the food industry. | Exposure, discussion, PowerPoint presentations | 2 |
| **Organic nitrogen compounds** (biogenic amines). | Exposure, discussion, PowerPoint presentations | 2 |
| **Carbohydrates**. Monosaccharides. | Exposure, discussion, PowerPoint presentations | 2 |
| **Carbohydrates**. Oligosaccharides. Polysaccharides in foods industry. | Exposure, discussion, PowerPoint presentations | 2 |
| **Lipids.** Fatty acids from lipids constitution. Alcohols of lipid constitution. | Exposure, discussion, PowerPoint presentations | 2 |
| **Lipids.** Simple and complex lipids. | Exposure, discussion, PowerPoint presentations | 2 |
| **Protide**. Amino Acids. Peptides**.** Proteins | Exposure, discussion, | 2 |

| | | |
|---|---|---|
| | PowerPoint presentations | |
| **Nucleic acids.** | Exposure, discussion, PowerPoint presentations | 2 |

Bibliography


1. Avram M. - *Chimie organică* – vol. I + II, Editura Zecasin, Bucureşti, **1999.**
2. Campbell P.N. şi A.D. Smith, *Biochimie ilustrată*, Ed. Academiei Române, Bucureşti, **2004.**
3. Dinischiotu A., Marieta Costache – *Biochimia glucidelor*- Editura Protransilvania Bucureşti, **1998.**
4. Garban Z. – *Biochimie. Tratat comprehensiv*, volum I , Editura Didactică şi Pedagogică, Bucureşti, **1999.**
5. Lehninger A.L. - *Biochimie- vol I*, Ed. Tehnică, Bucureşti, **1987.**
6. Neamţu G., G. Cîmpeanu, Carmen Socaciu – *Biochimie vegetală ( partea structurală)*, Ed. Didactică şi Pedagogică, Bucureşti, **1993.**
7. **Vicaş S.I.**, *Biochimie: structura şi funcţiile bioconstituenţilor vegetali*, Ed. AcademicPres, Cluj-Napoca, **2008**.
8. **Vicas S.I.**,*Elemente de chimie organica si biochimie. Aplicatii in stiinta alimentelor*, Ed. Universitatii din Oradea, **2012.**


The courses are uploaded to the e-learning platform of the University of Oradea, which can be accessed at https://e.uoradea.ro

| 8.2 Seminar | Methods of teaching | No. of hours/ Remarks |
|---|---|---|
| | | |
| 8.3 Laboratory | | |
| General rules on work protection in organic chemistry laboratory. Methods related with organic chemistry laboratory. | Exposure, discussion | 2 |
| The purification and separation of organic compounds. Sugar Recrystalization. | Students performing the experimental section with the professor's assistance. | 2 |
| The purification and separation of organic compounds.. Distilation. Determination of boiling point. | Students performing the experimental section with the professor's assistance. | 2 |
| The purification and separation of organic compounds. Sublimation. Determination of melting point. | Students performing the experimental section with the professor's assistance. | 2 |
| The purification and separation of organic compounds. The thin layer chromatography. The separation of food dyes. | Students performing the experimental section with the professor's assistance. | 2 |
| Qualitative reactions for identification of functional groups of organic compounds. Identification of alcoholic and phenolic hydroxyl groups | Students performing the experimental section with the professor's assistance | 2 |
| Qualitative reactions for identification of functional groups of organic compounds Identification of carbonil and carboxil groups. | Students performing the experimental section with the professor's assistance | 2 |
| Carbohydrates. The general reaction of carbohydrates. | Students performing the | 2 |

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| Monosaccharides (oxidation to a carboxylic acid group). | experimental section with the professor's assistance | |
| Identification of pentoses. Differentiation of aldose to ketose. Reactions specific to oligosaccharides and polysaccharides. | Students performing the experimental section with the professor's assistance | 2 |
| Lipids. Lipids solubility. Qualitative determination of oil rancidity. | Students performing the experimental section with the professor's assistance | 2 |
| Protide. Obtaining of protein extracts. General reactions for amino acid and proteins. Reaction of protein precipitation. | Students performing the experimental section with the professor's assistance | 2 |
| Quantitative determination of proteins by Bradford method. | Students performing the experimental section with the professor's assistance | 2 |
| Nucleic acids. Hydrolysis of nucleoproteins. | Students performing the experimental section with the professor's assistance. | 2 |
| Laboratory test | | 2 |
| 8.4 Project | | |
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| | | |

Bibliography

**Vicaş S.,** *Chimie organică şi biochimie –lucrări practice*, Ed. AcademicPres, Cluj-Napoca, **2008**.
**Vicaş S.,** *Chimie generala, organică şi biochimie –caiet de lucrări practice,* Oradea*,* **2014 .**
The laboratory are uploaded to the e-learning platform of the University of Oradea, which can be accessed at https://e.uoradea.ro

* 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 course "Organic Chemistry and Basic Biochemistry", put the fundamentals in terms of food chemistry, and thus make possible the application of knowledge in all areas of the food industry Course content is adapted to current food domain, focusing on the practical aspect of these topics

**10. Evaluation**

| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Share in the final grade |
|---|---|---|---|
| 10.4 Course | The exam is oral. The knowledge for Note 5 is appropriate to the minimum scale and the knowledge for Note 10 is appropriate to the maximum accepted scale. During the course will be given tests on whose average is 20% of the final grade. | Oral exam | 70% |
| 10.5 Seminar | | | |
| 10.6 Laboratory | The efforts of each student in laboratory practical work during the semester, are recorded during all | Laboratory | 30% |

| | | | |
|---|---|---|---|
| | regular meetings to which are added laboratory test (oral). For 5 grade is necessary knowledge according to minimum scale adopted and for 10 the knowledge for the maximum rate adopted. | test | |
| 10.7 Project | | | |
| 10.8 Minimum standard of performance | | | |
| The student will be familiarized with organic compounds and biomolecules classes. He/She will be able to recognized the compounds and its integrated in the corresponding class. Knowledge mechanisms of action of the compounds in foods.<br>The student has the ability to perform qualitative and quantitative determination specifically organic chemistry and biochemistry<br>The student has the ability to display the results in the form of comments, graphs, charts or tables, and correctly interpret test results obtained. | | | |

Date of completion

Signature of course holder**

Assoc Prof Simona Ioana Vicas, PhD
(svicas@uoradea.ro )
.....

Signature of seminar laboratory/project holder **

Șef de lucrări dr.ing. Rosan Cristina
(cristinabals@yahoo.com)
.....

Date of approval in the department

.....

Signature of the Head of Department

Lecturer eng. Adrian Timar, PhD
.....

Dean signature

Assoc.prof. dr. ing. Cristina Maerescu
.....