Biochemistry

(Specialization Horticulture 1st Year of study, 2nd Semester)

Credit value (ECTS): 4

Course category: Core discipline (mandatory)

Course holder: Assoc. Prof. PATRAS Antoanela, PhD

Objectives of the discipline (course and practical works)

During the course, students must acquire knowledges regarding the main classes of biochemical compounds, their repartition and importance, their physical and chemical properties.

The practical works aim to familiarize the students with the biochemical techniques in laboratories and the operating principles of specific devices, as well as the correct application of the analytical methods of the main compounds.

Contents (syllabus)

Course (chapters/subchapters)
1. Introduction to Biochemistry
2. Fundamental bioconstituents: bioelements and biomolecules
3. Carbohydrates **Monosaccharides.** Structure, isomers, examples, properties. **Oligosaccharides.** Classification. Examples. Properties. **Polysaccharides.**
4. Lipids General information. Structure. Classification Lipid precursors. Fatty acids. **Simple lipids** **Complex lipids**
5. Proteic compounds General information. Classification. **Amino acids** **Peptides** **Proteins**
6. Vitamins (hydrosolubles, liposolubles)
7. Enzymes. General information. Characteristics. Mechanism of action. Classification
8. Phytohormones Generalities. Classification. Examples.
9. Nucleic acids Components of nucleic acids Nucleotides: structure, properties
10. Secondary biomolecules. General information. Examples. Importance.
11. Metabolism - fundamentals

Practical activity
1. General information concerning the biochemical analysis.
2. Determination of dry weight and moisture content.
3. Determination of ash content
4. Identification of monosaccharides
5. Disaccharides – analyse of chemical reducing character. Sucrose hydrolysis.
6. Starch reactions
7. Quantitative analysis of carbohydrates
8. Lipids. Soxhlet extraction
9. Hanus index of lipids
10. Qualitative and quantitative analysis of amino acids
11. Proteins identification by colour reactions
12. Reversible and irreversible denaturation of proteins
13. Vitamin C analysis
14. Determination of total polyphenolic compounds (D280 method). Final laboratory evaluation. Conclusions.

Bibliography

1. Patraş, A. – Biochimie, Editura PIM, Iaşi, ISBN 978-606-13-5597-6, 2020
2. Savu, M., Afusoae, I., Nechita Patraş, A., Trofin, A., Marcu I. – Biochimie vegetală, lucrări practice, USAMV Iaşi, 2000
3. Lupea, A. X. – Biochimie, Fundamente, Ed. Academiei Române, 2007

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Final exam	Written / oral examination	60%
Evaluation of the activity during the semester	Written and oral assessments during the semester	40%

Contact

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