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| **Name of the Course**: **Organic and Biochemistry** | **Credit value: 3** |
| **Course classification**: compulsory | |
| **The proportion of the theoretical/practical nature of the course, „educational character”:** 50/50% (credit%) | |
| **Type of the course,** and number of lessons: 28 hours of lectures and 28 hours of practice in the given semester  Additional ways and characteristics to be used in the transfer of the given knowledge: - | |
| **Exam type**: written exam  Additional methods to be used in the knowledge test: written tests, assignments | |
| **Curriculum location of the course (which semesters**): 1st semester | |
| Prerequisites: - | |

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| Course description: a brief, yet informative description of the knowledge to be acquired (14 weeks). |
| The general aim of the course are :  to introduce the organic compounds present in plants, discussing their biological function, describing their formation and degradation in the intermediate metabolism.   1. week: Functional groups, intermolecular forces and physical properties of organic compounds 2. week: A brief characterization of alkanes, alkenes, dienes, polyenes (terpenes), alcohols and aliphatic oxo compounds. (Physical-chemical properties. Their most important representatives.) 3. week: Physical and chemical properties of carboxylic acids, their derivatives ( esters ) week:. 4. week: Carbohydrates. Properties of mono-, di and polysaccharides. Relationship between structure and biological function. 5. week. Amino acids, dipeptides, polypeptides. Structure and grouping of proteins. Biological functions of proteins. Protein classification. Structure of cell membranes. 6. week. Lipids (Classification, structure, biological function.) 7. week: week: Aromatic compounds: benzene, phenols and quinones. Heterocyclic compounds. Pyridine, pyrimidine, purine, pyrrole, Indole backbone, indole backbone compounds. Porphine backbone compounds and their biological functions. 8. week: Structure of nucleotides. Structure of NAD +, NADP +, FAD, ATP, their biological role. Primary structure and secondary structure of nucleic acids. Biological function of nucleic acids. 9. Week . Protein synthesis. Hydrolysis of proteins 10. week: The enzymes. Classification of enzymes. Regulation of enzyme function. Common features of vitamins and their mechanism of action. Plant hormones. 11. week: Photosynthesis. The light and dark phase of photosynthesis. Synthesis of sucrose and starch. C3 - C4 - plants. 12. week: Degradation of carbohydrates. Reaction sequence and energy balance of glycolysis, citric acid cycle and terminal oxidation. Direct oxidation of glucose (pentose phosphate cycle). Glucose resynthesis. 13. week: Fermentation processes. 14. week: Fat metabolism. Biosynthesis of fatty acids. Decomposition and energy balance of saturated, unsaturated, even and odd carbon fatty acids. |
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| Practise:   1. week: Practise to write structural formula and bond line drawing, 2. week: Test + The study the physical properties and alkalinity of organic chemicals 3. week: Separation of leaf pigments with thin layer chromatography 4. week: Test + Making solutions, acid-base titration 5. week: Determination of C-vitamin content (iodometric titration) 6. week: Test + Test tube experiments with carbohydrates 7. week: Experiments with amino acids and proteins 8. week: Test + Total nitrogen determination (Kjeldahl method) 9. week: Qualification of fats and oils 10. week : Test + The study of enzyme activity versus substrate concentration. 11. Week: The study the enzyme activity of amylase enzyme vs temperature 12. week: Test +The study of UV-Vis spectrometry method , analysis of salicylic acid measurement data 13. week: Investigation of the function of protein degrading enzymes. 14. week: Test + Refractometer , hydrometer (determination of sugar and alcohol content) 15. week: Final test |
| **Required and recommended reading:** |
| Required reading:  Frederick A. Bettelheim, Mary K. Campbell, Shawn O. Farrell, William H. Brow (2014) Introduction to General, Organic and Biochemistry ISBN-13-9780495110699  Recommended reading:  Cox, M. M., & Nelson, D. L. (2008). Lehninger principles of biochemistry (Vol. 5). New York: Wh Freeman.  David R, Klein Organic chemistry as a second language 2004, John Wiley and Sons Inc, ISBN 0-471-27235-3 |
| **Competencies to be acquired, related to the course:** |
| 1. **knowledge**   - Knowledge of organic compounds found in plant organisms, their properties, biological functions and processes in cells.  -Knowledge of the quality indicators of the food raw materials (for proteins, lipids, carbohydrates).   1. **abilities**   - The student will be able to successfully acquire knowledge of other subjects (physiology, plant nutrition, etc.).  - The student recognizes the unity of the natural sciences, thus increasing the problem-solving skills.   1. **attitude**   - By acquiring the knowledge of the subject, the student develops a scientific way of thinking and approach.  - His professional interest becomes deepened.   1. **autonomy and responsibility**   - The student will be able to make an independent decision because of the confident, accurate and thorough knowledge. |

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| **Course leader** (name, position, degree): Erdeiné Dr. Kremper Rita Assistant Professor, PhD. |
| **Other lecturer(s) involved in teaching the course, if any** (name, position, degree): - |