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| **STUDY PROGRAMME:** | **Professional Undergraduate Study Programme Agriculture** Specific field of study: Management in agriculture | |
| **Course:** | **BASICS OF PLANT NUTRITION** | |
| **Course code: 273294**  **Status**: compulsory | **Semester: IV** | **ECTS credits: 3** |
| **Course holder:** | **Ivka Kvaternjak,** Ph.D., professor of professional studies | |
| **Course associates:** | Filip Rutić, M.Eng.Agr., assistant | |
| **Modes of delivery:** | **Number of hours** | |
| Lectures | 30 | |
| Excersises, | 10 | |
| Seminars | 5 | |

**Course objectives:** To acquaint students with the relationships and legalities of plant nutrition and to connect basic knowledge about the way nutrients are used with the needs of individual plant species/cultivars. To train students so that in direct production, they can achieve satisfactory yields with proper nutrition and fertilization of plant crops, with optimal utilization of the plant fertility potential, soil fertility and maximum conservation of natural resources.

**Course content**

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|  | **Course units** | **L** | **E** | **S** | **Places of delivery** |
| 1. | Introduction to plant nutrition as a scientific discipline, definitions, division, biogenic elements (macro and microelements), useful elements, division according to physiological functions | 3 |  |  | Lecture hall |
| 2. | Soil as a source of plant nutrients, features important for plant nutrition | 2 |  | 1 | Lecture hall |
| 3. | Forms of nutrients in the soil, dynamics of nutrients | 2 |  |  | Lecture hall |
| 4. | Factors affecting nutrient intake. | 2 |  |  | Lecture hall |
| 5. | Receiving nutrients, passive active | 2 |  |  | Lecture hall |
| 6. | Soil fertility | 3 |  | 1 | Lecture hall |
| 7. | The content of mineral substances in plants | 2 |  |  | Lecture hall |
| 8. | Macroelements (Nitrogen, Phosphorus) | 2 |  | 1 | Lecture hall |
| 9. | Macroelements (potassium and calcium) | 2 |  |  | Lecture hall |
| 10. | Macroelements (magnesium, sulfur) | 2 |  |  | Lecture hall |
| 11. | Microelements (Fe, Cu, Mn, Zn, B, Mo, Cl, Ni) | 2 |  | 1 | Lecture hall |
| 12. | Microelements (Zn, B, Mo, Cl, Ni) | 2 |  | 1 | Lecture hall |
| 13 | Useful and toxic elements. | 2 |  |  | Lecture hall |
| 14. | Fertilizers (organic, mineral) | 2 |  |  | Lecture hall |
|  | Colloquium |  |  |  | Lecture hall |
| 1. | Fertility control |  | 1 |  | Lecture hall |
| 2. | Basic chemical analyzes of soil, determination of soil reaction, amount of humus, hydrolytic acidity, |  | 2 |  | Lecture hall |
| 3. | Determination of nitrogen, phosphorus and potassium in soil, spectrophotometry and flame photometry |  | 4 |  | Laboratory |
| 4. | Calculations, interpretations of analysis results |  | 3 |  | Lecture hall |
|  | Exercise colloquium |  |  |  | Lecture hall |
|  | **In total** | **30** | **10** | **5** |  |

L=Lectures, E=Excersises, S=Seminars, PT=Practical training

**Learning outcomes (LO)**

After passing the exam, the student will be able to:

LO 1. Classify plant nutrients according to amounts needed by plants and physiological functions

LO 2. Assess the suitability of the soil for growing certain crops

LO 3. Explain the role of certain essential macro and micronutrients and the effect of toxic elements

LO 4. Determine the amount of nutrients in the soil and the needs for individual plant species

Course holder:

Ivka Kvaternjak, Ph.D., professor of professional studies

Križevci, July 2024