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| **Study programe:** | **Professional undergraduate study in Agriculture**  Specific field of study: Plant production, Zootechnics and Management in agriculture | |
| **Course:** | **CONSERVATION AGRICULTURE** | |
| **Course Code:** 115627  **Course Status**: elective | **Semester:** **III** | **ECTS credits: 4** |
| **Course Holder:** | **Ivka Kvaternjak,** Ph.D., professor of professional studies | |
| **Course Associates:** | **Andrija Špoljar**, Ph.D., professor of professional studies | |
| **Modes of delivery:** | Number of hours | |
| Lectures | 30 | |
| Exercises | 20 | |
| Seminars | 10 | |

**COURSE OBJECTIVES:** To acquaint students with management measures for the intensification of sustainable agricultural production with an emphasis on adaptation to climate conditions and environmental protection.

**COURSE CONTENT**

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|  | **Course units** | **Modes of delivery:** | | | **Places of delivery** |
| **L** | **E** | **S** |
| 1. | INTRODUCTION, CONSERVATION AGRICULTURE | 1 | - | - | lecture hall |
| 1.2. | Historical development and basic principles of conservation agriculture | 2 | - | - | lecture hall |
| 1.3. | The role of conservation agriculture in mitigating climate change | 2 | - | 2 | lecture hall |
| 1.4. | Omitted tillage, advantages and disadvantages, Soil coverage during the year (crops, crop residues, mulch), crop rotation, legumes | 2 | - | 2 | lecture hall |
| 1.5. | Economic and ecological advantages of conservation agriculture | 1 | - | 2 | lecture hall |
| 2. | SOIL QUALITY | 1 | - | - | lecture hall |
| 2.1. | Assessment of soil quality (fertility, productivity, health) | 2 | - | - | lecture hall |
| 3. | Causes of soil degradation (deforestation, excessive grazing, inappropriate land management) | 1 | - | - | lecture hall |
| 4. | TYPES OF SOIL DEGRADATION |  |  |  | lecture hall |
| 4.1. | Physical processes of degradation | 3 | - | - | lecture hall |
| 4.1.1. | Anthropogenic compaction and subsidence |  |  |  | lecture hall |
| 4.1.2. | Excessive water saturation, falling groundwater level |  |  |  | lecture hall |
| 4.1.3 | Subsidence of organic soils |  |  |  | lecture hall |
| 4.1.4. | Desertification |  |  |  | lecture hall |
| 4.1.5. | Soil erosion by water and wind |  |  |  | lecture hall |
| 4.2. | Chemical processes of soil degradation | 3 | - | - | lecture hall |
| 4.2.1. | Loss of nutrients and organic matter |  |  |  | lecture hall |
| 4.2.2. | Acidification |  |  |  | lecture hall |
| 4.2.3. | Salting and alkalizing |  |  |  | lecture hall |
| 4.2.5. | The influence of soil degradation on the fertility and yield of crops | 2 |  |  | lecture hall |
| 5.1. | The influence of the degradation process on soil fertility |  | - | - | lecture hall |
| 6. | Degradation of biological features of the soil | 2 |  |  | lecture hall |
| 6.1. | Reduction of organic carbon content and soil biodiversity |  |  |  | lecture hall |
| 7. | CONSERVATION TILLAGE OF THE SOIL | 1 | - | - | lecture hall |
| 7.1. | Application of conservation tillage in Croatia, Europe and the world | 1 | - | - | lecture hall |
| 7.2. | Economic and environmental aspects of conservation tillage | 2 | - | 2 | lecture hall |
| 7.4. | Environmentally acceptable tillage, | 2 | - | - | lecture hall |
| 7.5. | The influence of conservation treatment on crop yields, Management of harvest residues, Optimizing soil moisture | 2 | - | 2 | lecture hall |
| 8. | Determination of CO2 emissions in g/m2 (with and without tIllage) | - | 7 | - | Laboratory and outside the Univeristy |
| 9. | Determining the sole of the plow, measuring the mechanical resistance of the soil | - | 4 | - | outside the University |
| 10. | Analysis of soil structural aggregates | - | 3 | - | lecture hall |
| 11. | Conservation of soil moisture and calculation of physical parameters (particle packing density, coating) | - | **1** | - | lecture hall |
| 12. | Prognostic method of soil erosion by water | - | **1** | - | lecture hall |
| 13. | Creating a sustainable crop rotation | - | 1 | - | lecture hall |
| 14. | Mineralization and humization (calculations) | - | 2 | - | lecture hall |
| 15. | Determination of the concentration of soluble salts in the soil | - | 1 | - | Laboratory |
|  | **TOTAL HOURS** | **30** | **20** | **10** |  |

Forms of teaching: L=lectures; E=exercises; S=seminars,

**LEARNING OUTCOMES (LO)**

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

LO 1. Formulate conservation agriculture, basic principles, advantages and disadvantages

LO 2. Assess the effect of conservation agriculture on soil fertility and food security

LO 3. Recommend measures to mitigate and/or eliminate soil degradation

LO 4. Choose a method of soil use and crop cultivation with lower CO2 emissions

LO 5. Determine soil moisture conservation

Course holder:

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

Križevci, July 2024