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| **STUDY PROGRAMME:** | **Professional Undergraduate Study Programme *Agriculture*** Specific field of study: Plant production |
| **Course:** | **PRINCIPLES OF PLANT PROTECTION** |
| **Course code:** 273284**Course status**: compulsory  | **Semester: III** | **ECTS credits: 5,5** |
| **Course holder:**  | **Marijana Ivanek-Martinčić,** Ph.D., professor of professional studies |
| **Course associates:**  | **Martin Bužić**, M.Eng.Agr. |
| **Modes of delivery:** | **Number of hours**  |
| **Lectures** | 30 |
| **Excersises** | 30 |
| **Practical training** | 15 |

**Course objectives:** Introduce students to the types of harmful organisms in plant production, their morphology, biology, and ecology, and their impact on plant production. Acquaint students with the selection of methods and systems for protecting plants from harmful organisms.

**Course content**

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| **Course units** | **Modes of delivery:** | **Places of delivery:** |
| **L** | **E** |
| 1. | Introduction to plant protection, importance of plant protection | 1 |  | Classroom |
| 2. | Entomology |  |  | Classroom |
| 2.1. | Introduction to entomology, types of pests in plant production | 1 |  | Classroom |
| 2.2. | Morphology and anatomy of insects- external organs of insects- internal organs of insects |  | 53 | Classroom |
| 2.3 | Reproduction and development of insects |  | 2 | Classroom |
| 2.4 | Systematics of insects- heterometabola- holometabola |   | 33 | Classroom |
| 2.5. | Ecology of insects; abiotic and biotic factors | 2 |  | Classroom |
| 2.6 | Mites, rodents, birds, snails, nematodes | 2 |  | Classroom |
| Midterm 1: entomology |  |
| 3. | Phytopathology |  |  |  |
| 3.1. | Introduction to phytopathology, non-parasitic and parasitic plant diseases | 1 |  | Classroom |
| 3.2. | Disease triangle, development cycle of plant pathogens, pathogenesis | 2 |  | Classroom |
| 3.3. | Environmental factors and disease development | 2 |  | Classroom |
| 3.4. | Pathogen characteristics important for disease development (infectious potential, aggressiveness, virulence, pathogenicity, etc.) | 1 |  | Classroom |
| 3.5. | Morphology of fungi |  | 1 | Classroom |
| 3.6. | Reproduction of fungi |  | 2 | Classroom |
| 3.7. | Basics of fungi systematics |  | 3 | Classroom |
|  | Identification of phytopathogenic fungi |  | 2 | Laboratory for testing the quality of agricultural reproduction material |
| 3.8. | Plant viruses – structure, reproduction, transmission, symptoms, damage, identification, control | 2 |  | Classroom |
| 3.9 | Phytopathogenic bacteria, phytoplasmas | 1 |  | Classroom |
| Midterm 2: phytopathology |  |
| 4. | Weeds, classification, reproduction methods, critical period of weediness | 2 |  | Classroom |
| 4.1. | Weed identification |  | 2 | Classroom |
| Midterm 3: practical presentation and weed identification |  |
| 5. | Plant protection measures and systems |  |  | Classroom |
| 5.1. | Plant protection measures – agrotechnical, quarantine, physical, biological, biotechnical | 4 |  | Classroom |
| 5.2. | Chemical measures in plant protection, advantages and disadvantages | 2 |  | Classroom |
| 5.2.1 | Phytopharmacy – classification of plant protection products |  |  | Classroom |
|  | - Zoocides | 1 |  | Classroom |
|  | - Fungicides | 1 |  | Classroom |
|  | - Herbicides | 1 |  | Classroom |
|  | - Use of phytoinformation system |  | 2 | Classroom |
| 5.3. | Plant protection systems – total, directed, integrated | 1 |  | Classroom |
| 5.3.1 | Principles of integrated plant protection | 1 |  | Classroom |
| 5.3.2 | Methods for predicting the occurrence of harmful organisms | 2 |  | Classroom |
| 5.3.3 | Assessment of harmful organism attack intensity |  | 2 | Plant Production Practicum |
|  | **IN TOTAL** | **30** | **30** |  |
| Written and oral exam: plant protection measures and systems |  |
| **Practical training** | **15** |  |
| Participation in plant protection measures, assessment of the need for implementing protection measures | 13 |  |
| Project Assignment Presentation | 2 |  |

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

**Learning outcomes (LO)**

LO 1. Present the morphology, anatomy, biology, systematics, and ecology of insects, and the main characteristics of mites, nematodes, snails, rodents, and birds important in plant production

LO 2. Compare plant disease agents based on their impact on plants, biology, and development conditions

LO 3. Differentiate weed species based on botanical characteristics and their impact on agricultural crops

LO 4. Present plant protection measures and systems, especially the integrated protection system and integrated plant production

LO 5. Differentiate plant protection products based on different criteria

LO 6. Present methods for forecasting and assessing the need for pest control

Course holder:

Marijana Ivanek-Martinčić, Ph.D., professor of professional studies

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