|  |  |
| --- | --- |
| **STUDY PROGRAMME:** | **Professional Graduate Study Programme *Agriculture* – *Sustainable and Organic Agriculture***  |
| **Course:** | **ECOLOGICALLY ACCEPTABLE METHODS OF PLANT PROTECTION**  |
| **Course code:** 141710**Course status**: compulsory  | **Semester: II** | **ECTS credits: 6** |
| **Course holder:**  | **Marijana Ivanek-Martinčić,** Ph.D., professor of professional studies |
| **Modes of delivery:** | **Number of hours**  |
| Lectures | 40 |
| Excersises | 16 |
| Seminars | 4 |

**COURSE OBJECTIVES:** Introduce the students to the selection of ecologically acceptable methods of plant protection and types of ecologically acceptable substances for plant protection. Introduce the students to the scale for measuring the ecological acceptability of substances. Enable the students to select adequate ecologically acceptable measures for protecting agricultural crops from harmful organisms within the scope of integrated or organic agricultural production.

**COURSE CONTENT**

|  |  |  |
| --- | --- | --- |
| **Course units** | **Modes of delivery:** | **Places of delivery:** |
| **L** | **E** | **S** |
| 1. | Basic principles of environmentally friendly plant protection and criteria for ecological acceptability | 1 |  |  | Classroom |
| 2. | Environmentally friendly plant protection measures |
| 2.1. | Agrotechnical measures | 4 |  |  | Classroom |
| 2.2. | Quarantine measures | 1 |  |  | Classroom |
| 2.3. | Mechanical measures | 2 |  |  | Classroom |
| 2.4. | Physical measures | 2 |  |  | Classroom |
| 2.5. | Biological measures |  |  |  |  |
|  | 2.5.1. Biological pest control |  |  |  |  |
|  | 2.5.1.1. Conservative biological method | 1 | 2 |  | Classroom |
|  | 2.5.1.2. Classical biological method | 1 |  |  | Classroom |
|  | 2.5.1.3. Augmentative biological method | 1 |  |  | Classroom |
|  | 2.5.2. Biological weed control | 1 |  |  | Classroom |
|  | 2.5.3. Biological disease control | 2 |  |  | Classroom |
|  | 2.5.4. Biopesticides |  | 2 |  | Classroom |
|  | 2.5.4.1. Macrobiological biopesticides | 2 |  |  | Classroom |
|  | 2.5.4.2. Microbiological biopesticides | 1 |  |  | Classroom |
|  | 2.5.4.3. Plant-based biopesticides | 1 |  |  | Classroom |
|  | 2.5.4.4. Naturalites |  |  |  |  |
|  | 2.5.4.5. Major global producers of biological control agents and their range of products (Koppert, Biobest, Brinkman, Biofa, etc.) |  | 1 |  | Classroom |
|  | 2.5.5. Natural enemies of pests in the environment | 1 | 1 |  |  |
| 2.6. | Biotechnical measures | 3 |  |  | Classroom |
| 2.7. | Plant strengtheners | 1 |  |  | Classroom |
| 2.8. | Homeopathic and biodynamic preparations | 1 |  |  | Classroom |
| 3. | Criteria for assessing the ecological and toxicological properties of plant protection products and labeling of plant protection products | 4 |  |  | Classroom |
| 3.1. | Assessment of the ecological acceptability of plant protection measures | 1 | 1 |  | Classroom |
| 4. | Environmentally friendly plant protection systems |
| 4.1. | Integrated protection |  |  |  | Classroom |
|  | 4.1.1. Principles of integrated plant protection | 1 |  |  | Classroom |
|  | 4.1.2. Decision thresholds in integrated plant protection | 1 |  |  | Classroom |
|  | 4.1.3. Critical period of weediness | 1 |  |  | Classroom |
|  | 4.1.4. Forecasting/assessing the occurrence of harmful organisms | 2 | 2 |  | Classroom /Plant Production Practicum |
| 4.2. | Plant protection in organic production | 2 |  |  | Classroom |
|  | 4.2.1. Legislation in organic production Regulation on the control system of organic farming (NN 11/2020 (29.1.2020)) Agriculture Act (NN: 118/18, effective from January 1, 2019) Act on Amendments to the Agriculture Act (NN 042/2020) Act on Amendments and Supplements to the Agriculture Act (NN 052/2021) REGULATION (EU) 2018/848 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on organic production and labeling of organic products and repealing Council Regulation (EC) No 834/2007 | 2 |  |  | Classroom |
| 5. | Protection of specific agricultural crops in integrated and organic production |  |  | 4 | Classroom |
| 6. | Professional visits to organic farms and farms in integrated production (field trips) |  | 5 |  | Outside the University |
|  | 6.1. Presentation of the integrated project assignment (IPA) |  | 2 |  | Classroom |
|  | IN TOTAL | 40 | 16 | 4 |  |

**L=Lectures, E=Excersises, S=Seminars,**

**LEARNING OUTCOMES (LO)**

LO 1. Present the principles of environmentally friendly plant protection and the criteria for the ecological and toxicological effects of plant protection products and procedures

LO 2. Compare different environmentally friendly plant protection methods based on their implementation and impact on harmful organisms and the environment

LO 3. Present the principles and procedures of integrated plant protection

LO 4. Present the principles, legal regulations, and procedures for plant protection in organic production

LO 5. Recommend environmentally friendly protection measures for specific crops against harmful organisms within the integrated plant protection system and organic production

LO 6. Critically evaluate the success of applied protection measures on a farm and propose necessary improvements

Course holder:

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

Križevci, July 2024