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| **Title and Code** of the subject:

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| **Chemistry of plant protection** |  **MTMNO7001A** |

 | **ECTS Credit Points: 2** |
| **Type** of the subject: **compulsory** / optional  |
| **Ratio of theory and practice: 2/2** (credit%) |
| **Type and number of classes per semester**: 28 hour(s) lecture and 28 hour(s) practice per **semester** Number of teaching hours / week : 2+2 (lecture and practice) |
| **Type of exam**: exam / **practical course mark** |
| **Subject in the curriculum:** semester 1 |
| Preliminary requirements: *-* |

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| **Summary of content - theory**: The aim of the subject to let the students to know the physical and chemical properties, the biological efficiency of pesticides. The dangers of poisoning of pesticides. The safety regulations of storage, transportation and application of pesticides, the basis of biochemistry, and the general characterisation and mode of action of inorganic and organic fungicides, zoocides and herbicides. |
| Course objectives: 1. Introduction
2. The physical and chemical properties, the biological efficiency of pesticides.
3. The dangers of poisoning of pesticides.
4. The safety regulations of storage, transportation and application of pesticides.
5. The biochemical basis of metabolism of pesticides. The construction and characterisation of enzymes.
6. Macromolecules I.: carbohydrates
7. The inhibition possibilities of synthesis of carbohydrates,
8. The inhibition possibilities of the breakdown processes of carbohydrates
9. Macromolecules II.: lipid
10. The inhibition possibilities of synthesis and breakdown processes of lipids
11. Macromolecules III.: nucleic acids.
12. The inhibition possibilities of synthesis of proteins
13. The inhibition possibilities of the breakdown processes of proteins
14. Photosynthesis
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| **Summary of content - practice**: Characterisation and effects of fungicides, zoocides and herbicides. Skills of making solutions, The role of water in making solutions, water harndness |
| 1. The general characterisation and mode of action of inorganic fungicides.
2. General characterisation, grupping and mode of action of organic fungicides I.
3. Organic fungicids and mode of their actions II.
4. Characterisation and classification of zoocides, characterisation and classification of insecticides natural insecticides, synthetic pyrethroids, organophosphate insecticides, carbamate insecticides.
5. Hormones altering the metamorphosis, hormone synthesis inhibitors, attractants, repellents, ferromones,
6. Acaricides, nematicides, molluscicides. rodenticides. Pesticides for soil sterilization, Pesticides for protecting stored products.
7. Plant hormones controlling the growth, hormone synthesis inhibitors, Opportunities for inhibition of photosynthesis.
8. Classification and inhibition possibilities of herbicides I.
9. Herbicides and their inhibition possibilities II.
10. Herbicides and their inhibition possibilities III.
11. Making solutions with different concentrations (counting)
12. Making solutions with different concentrations (in practice)
13. The chemical basics of water hardness, Measurement of water hardness
14. The chemical basics of water softening
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| **Literature, handbooks in English**  |
| 1. Biochemistry. Christopher K. Mathews, K. E. van Holde, The Benjamin/Cummings Publishing Company, 1990. ISBN: 0-8053-5015-2.
2. The biochemistry and uses of pesticides. Kenneth A. Hassall, Macmillan Press., 1990. ISBN: 0-333-49789-9.
3. Pesticide chemistry, Gy. Matolcsy, M. Nádasy, V. Andriska, Akadémiai kiadó, Budapest, 1988. ISBN: 963-05-4573 X.
4. The biochemistry and uses of pesticides. Kenneth A. Hassall, Macmillan Press., 1990. ISBN: 0-333-49789-9.
5. Interactions between herbicides and the soil, R. J. Hance, ACADEMIC PRESS. INC. (London) LTD. 1980. ISBN: 0-12-323840-4.
 |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* basic knowledge in applied organic chemistry and biochemistry to understand the mechanism of action of pesticides
* basic knowledge of chemical properties and mechanism of action of fungicides
* basic knowledge of chemical properties and mechanism of action of zoocides
* basic knowledge of chemical properties and mechanism of action of herbicides
1. **Skills:**
* knows the effects of fungicides
* knows the effects of zoocides
* knows the effects of herbicides
1. **Attitude:**
* self-determination
* initiative
1. **Autonomy and responsibility:**
* Able to work both autonomously and in cooperation with colleges.
* Able to make a decision based on knowledge of the subject.
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| **Responsible lecturer: Balláné Dr. Kovács Andrea (associate professor)** |
| **Other lecturer(s): -** |

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| **Terms of course completion:** |
| 1. Take a written exam at the end of the semester
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| **Form of examination:** |
| writing test |
| **Requirement(s) to get signature:** |
| Take part in practice, Successful completion of lab practice  |

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| **Exam questions:** |
| Equal to the course and practice objectives |