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| Name of course: **Agrochemistry** | **Credit value: 3** |
| **Course** **classification**: compulsory | |
| **The proportion of the practical nature of the course, „educational character”:** | |
| **Type of course: 2** theoretical / 1 practical, 2+1 and the **total number:** 42 hours 28 lectures + 14 hours practices in the given **semester.**  Further (unique) means and properties of knowledge transfer: | |
| **Exam** type (colloquium / practical grade / **other** ):  **Colloquium**  Further (unique) means of knowledge verification**:** | |
| The curricular **place of the course** (which semester): 2. semester | |
| Prerequisites (if any): **-** | |

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| **Course description: a brief, but informative description of the knowledge to be acquired (14 weeks).** |
| The general objective of the subject is to train students who are familiar with the chemical and agrochemical basics of plant nutrition and environmentally friendly nutrient management, the theoretical and practical features of plant nutrition, and the role and possibilities of nutrient supply.  Lectures:  1. Plant nutrients (essentiality, classification).  2. Chemical composition of plants (water, dry matter, ash, organic matter content).  3. Nutrient uptake of plants and influencing factors  4. Effect of nutrient supply on the yield and quality of plants.  5. Nitrogen in the soil, nitrogen uptake by plants, the role and deficiency symptoms of nitrogen  6.. The role of phosphorus in plants and potassium, deficiency symptoms  7. The role of calcium, magnesium and sulphur in plants, deficiency symptoms  8. Micronutrients and their role in plants, deficiency symptoms  9. Nitrogen fertilizers and their application  10. Slow release nitrogen fertilizers  11. Phosphorus-, potassium-, magnesium- containing fertilizers, application  12. Micronutrient containing fertilizer, application  13. Compound fertilizers, mixed fertilizers, environmental risks of chemical fertilizers.  14. Organic fertilizers  Practices:   1. Rules of soil sampling for agricultural purposes. Transport soil to the laboratory. Preparation of the laboratory soil sample 2. Extraction reagents, Extraction procedure, Standards, Calibration procedure 3. Measurement of soil pH, measurement of soil EC 4. Measurement of extractable soil phosphorus. Method of P determination. 5. Calculation of the data of soil P measurement. Interpretation of data. 6. Rules of plant sampling, 7. Measurement and calculation of plant moisture, dry matter and ash content.   8. Plant tissue test  9. The basics of making nutrient solutions for foliar fertilization. Concentration calculations  10. Preparation of nutrient solutions with different concentrations  11. Chemical characterization of different fertilizers I.  12. Chemical characterization of different fertilizers II.  13. Measurement of pH and EC of aqueous solutions of different fertilizers solutions  14. Calculation of the simplified nutrient balance |
| **Required and recommended reading:** |
| **Required reading:**  K. Mengel and EA Kirkby (1987). Principles of plant nutrition, Lang Druck AG, Liebefeld / Bern, 685p. ISBN: 3-906-535037    Benton Jones, Jr. (2001). Laboratory Guide for Conducting Soil Tests and Plant Analysis, CRC press, Taylor and Francis Group, 363p. ISBN: 0-8493-0206-4.  **Recommended reading:**  Benton Jones, Jr. (2012). Plant nutrition and soil fertility manual, CRC press, Taylor and Francis Group, 282p. ISBN: 978-1-4398-1609-7 |
| **Competencies to be acquired, related to the course:** |
| **a) Knowledge:**  - The students will have general theoretical and practical knowledge related to the field of plant nutrition.  - The students’s theoretical and practical knowledge of plant nutrition and nutrient management will be organized into a system.    **b) Ability:**  - The student will be able to implement nutrient supply in an environmentally friendly way.  - Plan and solve the tasks of plant nutrition by selecting the suitable fertilizers, methods and tools, and applying them individually and in a complex way.  **c) Attitude:**  - The students will be open to new results and innovations in nutrient management, and will seek to learn, understand and apply them.  - Pursue continuous self-education.  **d) Autonomy and responsibility:**  - The students will carry out the nutrient supply tasks independently, in an environmentally friendly way and under constant self-monitoring,  - Students will have a sense of responsibility and reflect on the consequences of their own actions. |

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| **Course leader** (name, post, academic degree): **Balláné Dr. Kovács Andrea PhD** |
| **Other lecturer(s) involved in teaching the course, if any** (name, post, academic degree): **-** |