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| **Title** of the subject: **Sustainable agricultural systems and technologies I – crop production MTMKG7004A** | **ECTS Credit Points: 3** |
| **Type** of the subject: compulsory  |
| **Ratio of theory and practice:** (credit%) **70/30** |
| **Type and number of classes per semester**: 28 hour(s) lecture and 14 hour(s) practice per **semester** Number of teaching hours / week : 2+1 (lecture and practice) |
| **Type of exam**: oral exam |
| **Subject in the curriculum:** semester 1 |
| Preliminary requirements:- |

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| **Summary of content - theory**:  |
| Course objectives: During the course, students learn the basics of the contact system between plant production and interactive environment. Our goal is to present biological, agroecological production and technological factors as a complex system, the system description prevailing energy and material processes. The concept, elements, types of alternative cropping systems. Conventional, sustainable, organic and other cropping systems. Sustainable crop production technology models of grain and forage crops.1. Definition of sustainable crop production, the change of world’s population.
2. Global land use data, proportion of cultivated land, challenge of the agriculture in the future.
3. The agricultural production and area of the main crops in the world.
4. Definition, significance and the aims of organic farming. What is the transition period in organic farming?
5. Nutrient supply possibilities in organic farming. Plant protection possibilities in organic farming.
6. Global water use, the main and special aims of irrigation.
7. Short evaluation of the irrigation methods.
8. Precision farming technologies and the benefits of precision farming.
9. What are the transgenic crops, the generations of GM crops?
10. The global GM crops’ area, the aims of creating GM plants, the main GM crops in the world.
11. Definition and benefits of agroforestry systems. Agroforestry practices.
12. Sustainable maize production technology.
13. Sustainable winter wheat production technology.
14. Sustainable alfalfa production technology.
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| **Summary of content - practice**: |
| Skills to be learn: 1. Definition of sustainable crop production, the change of world’s population.
2. Global land use data, proportion of cultivated land, challenge of the agriculture in the future.
3. The agricultural production and area of the main crops in the world.
4. Definition, significance and the aims of organic farming. What is the transition period in organic farming?
5. Nutrient supply possibilities in organic farming. Plant protection possibilities in organic farming.
6. Global water use, the main and special aims of irrigation.
7. Short evaluation of the irrigation methods.
8. Precision farming technologies and the benefits of precision farming
9. What are the transgenic crops, the generations of GM crops?
10. The global GM crops’ area, the aims of creating GM plants, the main GM crops in the world.
11. Definition and benefits of agroforestry systems. Agroforestry practices.
12. Sustainable maize production technology
13. Sustainable winter wheat production technology
14. Sustainable alfalfa production technology
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| **Literature, handbooks in English**  |
| 1. Alabaster Jenkins (2016): Agronomy and crop production. ISBN 978-1682860373
2. Corey Aiken (2015): Crop Production: Technology and Methodology ISBN 978-1632391346
3. Nand Kumar Fageria (2014): Nitrogen Management in Crop Production ISBN 978-1482222838
4. Muhammad Ashraf (2012): Crop Production for Agricultural Improvement ISBN 9789400741157
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| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* Basic knowledge of natural, technical, economic sciences, technologies, food-chain security giving the basis for the sustainable crop production
* Acquired knowledge to up-to date technologies used in sustainable crop production and their practical application
* Students will be able to proactively learn new skills and develop themselves for present and future progression
* Students are capable to communicate effectively and professionally; can participate in the sustainable crop production process directly or support it
* Students can actively and operatively contribute to the implementation of R&D projects
1. **Skills:**
* Ability to recognize and solve routine like problems occurring in sustainable crop production processes
* Students can understand and observe the law, protocols and regulations connected to sustainable crop production
1. **Attitude:**
* Able to approach professional questions constructively
* Students look for ways to change work methods to improve performance
* The health of the individual and society besides environmental protection plays an important part in professional decisions
1. **Autonomy and responsibility:**
* Students are able to bear the responsibility of the decisions and are responsible for their own and the workforce’s work connected to them
* Students are decisive at the right time
* Based on professional knowledge students can set up the implementation plan of R&D projects independently, and bear the responsibility for directly managing the development activity
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| **Responsible lecturer: Dr. habil József Csajbók, associate professor, Ph.D.** |
| **Other lecturer(s):**  |

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| **Terms of course completion:** |
| 1. Completing assignments
2. Giving a short presentation on a given topic
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| **Form of examination:** |
| oral |
| **Requirement(s) to get signature:** |
| attendance and active work in the practices, giving a short presentation |

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| **Exam questions:** |
| 1. What is the definition, significance and the main aims of organic farming? What is the transition period in organic farming?
2. What are the nutrient supply possibilities in organic farming?
3. What are the plant protection possibilities in organic farming?
4. Characterize the global water use, the main and special aims of irrigation!
5. Evaluate the irrigation methods!
6. Review the definition of sustainable crop production, the change of the world’s population!
7. What are the global land use data, proportion of cultivated land, challenge of the agriculture in the future?
8. Evaluate the agricultural production and areas of the main crops in the world!
9. What are the precision farming technologies and the benefits of precision farming?
10. What are the transgenic crops, the generations of GM crops?
11. Review the the global GM crops’ area, the aims of creating GM plants, the main GM crops in the world!
12. What are the definition and benefits of agroforestry systems?
13. Characterize the agroforestry practices!
14. Review the sustainable maize production technology!
15. Review the sustainable winter wheat production technology!
16. Review the sustainable alfalfa production technology!
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