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| Name of course: **Agricultural microbiology** | **Credit value: 3** |
| **Course** **classification**: **compulsory** |
| **The proportion of the practical nature of the course, „educational character”:** 50 % |
| **Type of course:** theoretical / practical, and the **total number: 28 hours** in the given **semester.**Further (unique) means and properties of knowledge transfer:  |
| **Exam** type (colloquium / practical grade / **other** ): colloquiumFurther (unique) means of knowledge verification**:** Overview and discussion of scientific publications |
| The curricular **place of the course** (which semester): 1st |
| Prerequisites (if any): **-**  |

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| **Course description: a brief, but informative description of the knowledge to be acquired (14 weeks).** |
| The aim of the subject is to provide appropriate basic knowledge for other courses (e.g. plant protection). The latest topics with agricultural and environmental interests will be discussed based on recent scientific publications. It will be introduced the role and significance of the most important microbiological processes in crop production. Basic skills and methods in a microbiological laboratory will be practiced in the laboratory.1. Introduction and major terms of microbiology, cell chemistry
2. Microbial metabolism
3. Basic microbial genetics.
4. Microbial evolution and systematics
5. Structure of prokaryotic cells. Diversity of Bacteria and Archea
6. Organelles and phylogeny of microbial eukaryotes. Protists
7. Fungal physiology, structure and symbiosis
8. Fungal systematics and important fungal taxons
9. Metabolic diversity of microorganisms.
10. Carbon cycle, and the role of microbes in the N2 fixation, ammonification and nitrification.
11. Nitrogen cycle, and the role of microbes in the cellulose and lignin degradation.
12. The role and importance of microbes in the phosphorus and sulfur cycle. Bioremediation.
13. The role and importance of microbiological processes in the crop production. The characteristics of the plant microbiome.
14. Microbes as plant fertilizers, biostimulants and biocontrol agents.
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| **Required and recommended reading:** |
| **Required reading:**Madigan, M. T, Martinko, J. M., Bender K., Buckley, D., Stahl, D (2015): Brock Biology of Microorganisms, Benjamin Cumming, 14th edition 1030 oldal, ISBN 978-1-292-01831-7Jay, J. M., Loessner, M. J., Golden, D. A. (2005): Modern Food Microbiology. ISBN 978-0-387-23413-7Adams, M. R., Moss M. O. (2008): Food Microbiology. The Royal Society of Chemistry. ISBN 978-0-85404-284-5**Recommended reading:**Karaffa E., Peles F (2014): Microbiological Aspects of Food Quality And Safety. Debreceni Egyetem, Debrecen.Relevant scientific reviews and articles |
| **Competencies to be acquired, related to the course:** |
| **a) Knowledge:** - Acquired basic knowledge of sciences, technologies, food-chain security giving the basis for agricultural microbiology.- Acquired knowledge to up-to date technologies used in agricultural microbiology and the practical application**b) Ability:**- Ability in recognizing and solving the routine like problems occurring in the agricultural microbiology.- Students can understand and observe the law, protocols and regulations connecting to agricultural microbiology**c) Attitude:** - Main feature is the constructive approach to the professional questions of microbiology.- Students look for ways to change work methods to improve performance in agricultural microbiology.- Health of the individual and society beside of environmental protection plays an important part in the professional decisions**d) Autonomy and responsibility:**- Students are able to bear the responsibility of the decisions and responsible for own and the attached workforce’s work- Students are decisive at the right time- Based on the professional knowledge students can set up the implementation plan of R&D projects independently, and bear the responsibility of direct managing of the development activity |

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| **Course leader** (name, post, academic degree): **Dr. Erzsébet Mónika Karaffa professor, PhD** |
| **Other lecturer(s) involved in teaching the course, if any** (name, post, academic degree): **Dr. Károly Pál senior research fellow, PhD** |