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| **Title** of the subject: **MTMAL7024A Aquaculture** | **ECTS Credit Points: 3** |
| **Type** of the subject:optional | |
| **Ratio of theory and practice:** (credit%) 75**/25** | |
| **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**: exam | |
| **Subject in the curriculum:** semester 1 | |
| Preliminary requirements:- | |

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| **Summary of content - theory**: |
| Course objectives: to provide theoretic information on semi-intensive, intensive and integrated aquaculture systems and technologies including key species, fish biology, technologies, feeding, and economics.   1. Current status and tendencies in aquaculture 2. Aquatic resources 3. Fish species of aquaculture 4. Water management in aquaculture 5. Hydrobiology and plankton management 6. Fish biology propagation and larvae management 7. Pond management 8. Feeding and nutrition 9. Cage aquaculture 10. Recirculating aquaculture 11. Integrated multitrophic aquaculture 12. Multifunctional aquaculture 13. Aquaculture economics 14. Business planning in aquaculture |
| **Summary of content - practice**: |
| Skills to be learnt: information will be provided for the practical application of theoretic skills. The essays, calculations, plans to be submitted are closely related to the topics below.  Contents:   1. Basics of construction design and calculations for a pond farm 2. Plankton sampling, evaluation and calculations of plankton yield 3. Propagation and larvae rearing of selected freshwater fish species 4. Feed design and formulation 5. Design plan of a cage aquaculture farm 6. Design plan of a recirculating aquaculture farm 7. Design plan of an integrated multitrophic aquaculture farm 8. Management plan of a pond farm 9. Management plan of an intensive aquaculture system 10. Business plan of a conventional aquaculture enterprise (pond farm or intensive system) 11. Business plan of a multifunctional aquaculture enterprise 12. Business plan of an integrated aquaculture enterprise |
| **Literature, handbooks in English** |
| 1. FAO (2016): The State of World Fisheries and Aquaculture 2016. Contributing to food security and nutrition for all. Rome. 200 pp. 2. Boyd, C.E., Lim, C., Queiroz, J., Salie, K., de Wet L., McNevin, A. (2012): Best Management Practices for Responsible Aquaculture. Aquaculture Collaborative Research Support Program [ACRSP] 3. Burke, D., Goetze, B., Clair D., Egna H. (1996): Pond Dynamics/Aquaculture. Collaborative Research Support Program. Office of International Research and Development Oregon State University, USA 4. Allan, G., Heasman H., Ferrar P. (2006): Aquaculture Nutrition: Report on the Aquaculture Nutrition Master Class held at Asian Institute of Technology, Bangkok Thailand 7-19 August 2006 ISBN 0 7347 1771 7 |
| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**  * Knowledge of technical expressions of aquaculture * Knowledge of basic principles of aquaculture technologies * Knowledge of the methods of skill improvement and learning in the relevant field of study (aquaculture)  1. **Skills:**  * Capable for using/managing aquaculture technologies * Capable of improving his/her knowledge and to use various methods of obtaining knowledge and self-education * Having good communication skills he/she is able to express his/her professional point of view in a debate * Capable for using the on-line and printed literature in the relevant field * Capable for problem solving individually or in a team  1. **Attitude:**  * Open for the opinion of others in the relevant field (aquaculture) * Open for the plans and questions of economic actors * Determined for the improvement of aquaculture technologies  1. **Autonomy and responsibility:**  * He/she is having the sense of responsibility and reflecting the consequences of his/her activities * Expresses his/her opinion individually with full responsibility and based on professional knowledge * Takes responsibility for the work of others |

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| **Responsible lecturer: László Stündl, PhD, associate professor** |
| **Other lecturer(s): Milán FehérPhD, Péter Bársony, PhD** |
| **Terms of course completion:** |
| 1. Completing assignments / exercises 2. Submitting essays on practical topics |
| **Form of examination:** |
| Oral or written exam |
| **Requirement(s) to get signature:** |
| Completion of the assignments / exercises and submission of essays on practical topics |

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| **Exam questions:** |
| 1. What are the main characteristics of aquaculture? 2. What are the main characteristics of the EU fish production & consumption? 3. What are the main design, construction and operation features of embankment ponds and excavated (levee) ponds? 4. What should be considered when a pond is designed, as it regards engineering? 5. What are the key Bacterio-, Phyto- and Zooplankton taxons in a fish pond? 6. What are the factors of environmental regulation spawning? 7. Describe the steps of hormone-induced spawning of fish. 8. Describe the steps of fry rearing in earthen ponds. 9. What are the nutrient (protein energy vitamin minerals) requirements of fish? 10. Describe the main reasons of formulating feeds, including feed ingredients. 11. Why organic fertilizers are used and what are the figures of manure application? 12. Describe feeding and feeding plan. 13. Characterize the key issues of harvesting, conditioning, packaging and live-transport. 14. What are the functional elements, main advantages and constraints of pond farm and a multifunctional pond farm? 15. Describe the integrated extensive-intensive pond culture techniques. |