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| **Title** of the subject: **Fish Breeding, MTMAL7016A** | **ECTS Credit Points: 3** |
| **Type** of the subject: Prime Course |
| **Ratio of theory and practice:** (credit%) **100/0** |
| **Type and number of classes per semester**: 28 hour(s) lecture and 0 hour(s) practice per **semester**  |
| **Type of exam**: exam |
| **Subject in the curriculum:** semester 3 |
| Preliminary requirements:- |
| **Summary of content - theory**:  |
| Course objectives: to provide information on the theory of fish genetics and breeding including the broodstock management, induced and natural reproduction, fry and larvae management. The knowledge acquired will enable to participate / cooperate in practical breeding programmes.Content:1. Introduction to fish breeding
2. Fish biology (Diversity, physiology, anatomy – reproduction organs)
3. Fish reproduction: natural spawning
4. Induced spawning
5. Larval development & rearing
6. Genetics
7. Breeding programmes (Mass, selective, etc.)
8. Breeding techniques
9. Biotechnology in fish breeding
10. Breeding in practice (preparation & propagation)
11. Breeding in practice (hatching & larvae management)
12. Breeding of carps
13. Breeding of percids
14. Breeding of catfishes
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| **Summary of content - practice**: |
| Skills to be learnt: no practice in this course |
| **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. Gomelsky. B. (2011): Fish Genetics: Theory and Practice March 2011 Publisher: VDM Verlag Dr. Müller ISBN: 9783639328059,
4. Ponzoni, R.W., B.O. Acosta and A.G. Ponniah. (eds). 2006. Development of aquatic animal genetic improvement and dissemination programs: current status and action plans, WorldFish Center Conference Proceedings 73, 120p.
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| **Competencies gained** *(acc. to the Regulation on training and outcome requirements)* |
| 1. **Knowledge:**
* Knowledge of technical expressions of fish breeding
* Knowledge of basic principles of fish breeding technologies
* Knowledge of the methods of skill improvement and learning in the relevant field of study (fish breeding)
1. **Skills:**
* Capable for using/managing fish breeding 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 (fish breeding)
* Open for the plans and questions of economic actors
* Determined for the improvement of fish breeding 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
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| **Form of examination:** |
| Oral or written exam |
| **Requirement(s) to get signature:** |
| Completion of the assignments / exercises and submission of essays on practical topics |
| **Exam questions:** |
| 1. Describe the main aims and objectives of fish breeding programmes?
2. What are the key organs responsible for spawning?
3. What are the key biological processes necessary for successful breeding in fish?
4. What are the main factors necessary for natural spawning?
5. Why induced spawning is widespread in aquaculture and what are its main steps?
6. Describe the stages of larval development.
7. Describe the larvae and fry rearing technology.
8. What is the genetic background of fish reproduction?
9. Describe the main types of breeding programmes.
10. What are the major breeding techniques used in freshwater fish?
11. What biotechnology is known and used in fish breeding?
12. What are the main steps of induced breeding of carps?
13. What are the main steps of induced breeding of percids?
14. What are the main steps of induced breeding of catfishes?
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