COURSE SYLLABUS

Academic year 2025 - 2026

1. Programme information

1.1. Higher Education Institution	**„Lucian Blaga" University of Sibiu**
1.2. Faculty	Faculty of Sciences
1.3. Department	Environmental Sciences, Physics, Physical Education and Sports
1.4. Field of study	Biology
1.5. Level of study [1]	Bachelor
1.6. Programme of study	Biology (in english)

2. Details about the course

2.1. Name of course	**Aquaculture**			Code	FSTI.MFE.BIORO.L.CA.6.2100.C-5.5
2.2. Course coordinator	Assoc. Prof. Doru Bănăduc, PhD				
2.3. Seminar / laboratory coordinator	Assoc. Prof. Doru Bănăduc, PhD				
2.4. Year of study[2]	3	**2.5.** Semester[3]	6	**2.6.** Evaluation form [4]	C
2.7. Course type [5]	O	**2.8.** The formative category of the course [6]			S

3. Estimated total time

3.1 Course Extension within the Curriculum – Number of Hours per Week				
3.1.a.Lecture	3.1.b. Seminar	3.1.c. Laboratory	3.1.d. Project	Total
2	1	-	-	**3**
3.2 Course Extension within the Curriculum – Total Number of Hours within the Curriculum				
3.2.a.Lecture	3.2.b. Seminar	3.2.c. Laboratory	3.2.d. Project	Total[7]
12	24	-	-	**36**

Time distribution for individual study	**Nr. ore**
Learning by using course materials, references and personal notes	30
Additional learning by using library facilities, electronic databases and on-site information	18
Preparing seminars / laboratories, homework, portfolios and essays	35
Tutorial activities[8]	2
Exams[9]	4

3.3. Total Individual Study Hours [10] *(NOSI$_{sem}$)*	**89**
3.4. Total Hours in the Curriculum (*NOAD$_{sem}$*)	**36**
3.5. Total Hours per Semester [11] (*NOAD$_{sem}$* + *NOSI$_{sem}$*)	**125**
3.6. No. of hours / ECTS	**25**

3.7. Number of credits[12]	**5**

4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum) [13]	-
4.2. Competencies	-

5. Conditions (wherever applicable)

5.1. For course/lectures [14]	-video projection system
5.2. For practical activities (lab/sem/pr/other) [15]	-laboratory with equipment for the collection and analysis of aquatic communities, physico-chemical analysis of water, video projection system

6. Learning outcomes

Number of credits assigned to the discipline: 5				
Learning outcomes				Credit allocation based on learning outcomes
Crt. no.	Knowledge	Crt. no.	Knowledge	
6.1.	The student/graduate describes, defines and discusses fundamental principles in the field of Biology, as well as interdisciplinary aspects (for example: General Ecology, etc.)	The student/graduate applies working methods using modern instruments/equipment and classic laboratory techniques to perform, design experiments, and appropriately record and analyze the results obtained.	The student/graduate uses his/her own knowledge and experiences to develop the scientific community and society in general by participating in professional and/or community activities	2,5
6.2.	The student/graduate correctly uses and explains the specific terminology used in the field of Biology, the main concepts and laws, the characteristics of biological systems from the perspective of the principles of organization and functioning of living matter	The student/graduate defines, describes, discusses/presents major concepts in the field of Biology	The student/graduate demonstrates responsibility and autonomy in the use of scientific knowledge in the field of Biology, by conducting research, developing or improving concepts, theories, operational methods or products, assuming ethical and professional decisions within the scientific process.	2,5

7. Course objectives (resulted from developed competencies)

7.1. General objective	Foundation of knowledge regarding aquaculture systems and their importance.
7.2. Specific objectives	Students' knowledge of the structural and functional particularities of aquaculture systems. Developing students' capacity to select species to be introduced into aquaculture. To develop a plan for the implementation of an aquaculture system.

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8. Course description

8.1. Lecture[16]	**Teaching methods**[17]	**Hours**
Curs 1 Introduction – definition and evolution of aquaculture systems. Aquatic organisms of interest for aquaculture.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Curs 2 Elements of genetics and physiology in the reproduction process of aquaculture. Artificial reproduction in mollusks and fish.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Curs 3 Digestive system, natural food and artificial food in fish. Trophic basis.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Curs 4 Morphopathology (atrophy, dystrophy, necrosis). Physiopathology (system dysfunctions; circulatory, digestive). Virosis, bacteriosis, parasitosis, intoxications.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Curs 5 Aquaculture facilities. Aquaculture tools and materials. Sampling and harvesting techniques in aquaculture. Environmental impact of aquaculture systems.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
Curs 6 High value aquatic species (natural, for production, companionship). Cyprinoculture, salmoniculture, sturgeoniculture. Monocultures. Complex cultures.	Lecture, explanation, heuristic conversation, catechetical conversation.	2
	Total lecture hours:	**12**

8.2. Seminars	**Teaching methods**	**Hours**
Act. 1. The importance of aquaculture species	Demonstration, case study, problematization, interactive dialogue	2
Act. 2. Aquaculture species in the context of artificial habitats	Demonstration, case study, problematization, interactive dialogue	2
Act. 3. Aquaculture species in the context of semi-natural habitats.	Demonstration, case study, problematization, interactive dialogue	2

Act. 4. Aquaculture species in the context of natural habitats.	Demonstration, case study, problematization, interactive dialogue	2
Act. 5., Experimental design of an aquaculture environment.	Demonstration, case study, problematization, interactive dialogue	2
Act. 6. Experimental aquaculture (mollusks – lotic environment).	Demonstration, case study, problematization, interactive dialogue	2
Act. 7. Experimental aquaculture (mollusks – lenitic environment).	Demonstration, case study, problematization, interactive dialogue	2
Act. 8. Experimental aquaculture (mollusks - toxicology).	Demonstration, case study, problematization, interactive dialogue	2
Act. 9, Experimental aquaculture (fish – lotic environment).	Demonstration, case study, problematization, interactive dialogue	2
Act. 10. Experimental aquaculture (fish – lenitic environment).	Demonstration, case study, problematization, interactive dialogue	2
Sem. 11. Identification of locations suitable for the implementation and development of aquaculture.	Demonstration, case study, problematization, interactive dialogue	2
Sem. 12. Aquaculture in Europe, North America, South America, Africa, Asia (case studies).	Demonstration, case study, problematization, interactive dialogue	2
	Total seminar hours	24

9. Bibliography

9.1. Recommended references	Bănăduc D., 2025, *Hidrobiologie. Note de curs* (format electronic)
	Curtean-Bănăduc A., 2001, *Practicum de hidrobiologie*, Ed. Mira Design, Sibiu
9.2. Additional refernces	Th. Bușniță, I. Alexandrescu, Atlasul Peștilor din apele R.P.R., ISBN/6958IPSIB, 1963, 199 p.
	Marian Bura, Acvacultură specială: broaște, crustacee, moluște. Edit. Orizonturi Universitare, ISBN 973-8391-02-4, 366 p.

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program [18]

The professional skills obtained by students through completing course hours and practical applications and developing assignments in this discipline are in line with the requirements of the administrative structures responsible for water resources management (Regia Apele Române – SGA, APM, AJVPS) and consulting firms in the field of environmental protection.

11. Evaluation

Activity type	11.1 Evaluation criteria	11.2 Evaluation of methods		11.3 Percentage in the final grade	Notes [19]
11.4a Exam / Coloquium	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester[20]:	10%	60% (minim 5)	
		Homeworks	30%		
		Other activitiesi[21]:	%		

		Final evaluation:	20% (min. 5)		
11.4b Seminar	● Frequency/relevance of participation or responses	Evidence of participation, portofolio of papers (reports, scientific summaries)		-	
11.4c Laboratory	● Knowledge of the equipment, how to use specific tools; evaluation of tools, processing and interpretation of results	● Oral exam ● Written questionaire ● Laboratory notebook, experimental works, reports, etc. ● Practical demonstration		40% (minim 5)	
11.4d Project	● The quality of the project, the correctness of the project documentation, the appropriate justification of the chosen solutions	● Self-evaluation, project presentation ● Critical evaluation of a project		-	
11.5 Minimum performance standard[22] – obtaining a grade of 5 on the written exam; – obtaining an average of 5 for the assignments received throughout the semester; – obtaining an average of 5 for laboratory activities. Definition of categories of aquatic ecosystems. Knowledge of basic notions regarding the aquatic biotope, adaptation of organisms to the aquatic environment, classification of aquatic communities, structure and functions of aquatic communities. General notions regarding the ecological assessment of aquatic systems.					

The Course Syllabus will encompass components adapted to persons with special educational needs (SEN – people with disabilities and people with high potential), depending on their type and degree, at the level of all curricular elements (skills, objectives, contents, teaching methods, alternative assessment), in order to ensure fair opportunities in the academic training of all students, paying close attention to individual learning needs.

Filling Date: |_1_|_1_| / |_0_|_9_| / |_2_|_0_|_2_|_5_|

Department Acceptance Date: |_1_|_7_| / |_0_|_9_| / |_2_|_0_|_2_|_5_|

	Academic Rank, Title, First Name, Last Name	**Signature**
Course Teacher	Assoc. Prof. Doru Bănăduc, PhD	
Study Program Coordinator	Assoc. Prof. Ana-Maria Benedek-Sîrbu, PhD	
Head of Department	Lecturer Ioan Tăușan, PhD	

[1] *Bachelor / Master*
[2] *1-4 for bachelor, 1-2 for master*
[3] *1-8 for bachelor, 1-4 for master*
[4] *Exam, colloquium or VP A/R - from the curriculum*
[5] *Course type: R = Compulsory course; E = Elective course; O = Optional course*
[6] *Formative category: S = Specialty; F = Fundamental; C = Complementary; I = Fully assisted; P = Partially assisted; N = Unassisted*
[7] *Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.2.a.b.c.)*
[8] *Între 7 și 14 ore*
[9] *Între 2 și 6 ore*
[10] *Suma valorilor de pe liniile anterioare, care se referă la studiul individual.*
[11] *Suma (3.5.) dintre numărul de ore de activitate didactică directă (NOAD) și numărul de ore de studiu individual (NOSI) trebuie să fie egală cu numărul de credite alocat disciplinei (punctul 3.7) x nr. ore pe credit (3.6.)*
[12] *Numărul de credit se calculează după formula următoare și se rotunjește la valori vecine întregi (fie prin micșorare fie prin majorare*

$$No.credite = \frac{NOCpSpD \times C_C + NOApSpD \times C_A}{TOCpSdP \times C_C + TOApSdP \times C_A} \times 30\ credite$$

Unde:

- NOCpSpD = Număr ore curs/săptămână/disciplina pentru care se calculează creditele
- NOApSpD = Număr ore aplicații (sem./lab./pro.)/săptămână/disciplina pentru care se calculează creditele
- TOCpSdP = Număr total ore curs/săptămână din plan
- TOApSdP = Număr total ore aplicații (sem./lab./pro.)/săptămână din plan
- C_C/C_A = Coeficienți curs/aplicații calculate conform tabelului

Coeficienți	**Curs**	**Aplicații (S/L/P)**
Licență	2	1
Master	2,5	1,5
Licență lb. străină	2,5	1,25

[13] *Se menționează disciplinele obligatoriu a fi promovate anterior sau echivalente*
[14] *Tablă, videoproiector, flipchart, materiale didactice specifice, platforme on-line etc.*
[15] *Tehnică de calcul, pachete software, standuri experimentale, platforme on-line etc.*
[16] *Titluri de capitole și paragrafe*
[17] *Expunere, prelegere, prezentare la tablă a problematicii studiate, utilizare videoproiector, discuții cu studenții (pentru fiecare capitol, dacă este cazul)*
[18] *Legătura cu alte discipline, utilitatea disciplinei pe piața muncii*
[19] *CPE – condiționează participarea la examen; nCPE – nu condiționează participarea la examen; CEF - condiționează evaluarea finală; N/A – nu se aplică*
[20] *Se va preciza numărul de teste și săptămânile în care vor fi susținute.*
[21] *Cercuri științifice, concursuri profesionale etc.*
[22] *Se particularizează la specificul disciplinei standardul minim de performanță din grila de competențe a programului de studii, dacă este cazul.*