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	Elements of Biostatistics and software Applied in Biology and Ecology		Code	FSTI.MFE.EPM.L.SO.1.1010.C-3.6	
2.2. Course coordinator	Lecturer Ioan Tăușan PhD				
2.3. Seminar / laboratory coordinator	Lecturer Ioan Tăușan PhD				
2.4. Year of study[2]	1	**2.5.** Semester[3]	1	**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	3.1.e Other	Total
1		1			**2**
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	3.2.e Other	Total[7]
14		14			**28**

Time Distribution for Individual Study [8]	**Hours**
Learning by using course materials, references and personal notes	25
Additional learning by using library facilities, electronic databases and on-site information	10
Preparing seminars / laboratories, homework, portfolios and essays	30
Tutorial activities [9]	6
Exams[10]	4

3.3. Total Individual Study Hours [11] ***(NOSI$_{sem}$)***	**47**
3.4. Total Hours in the Curriculum (*NOAD$_{sem}$*)	**28**
3.5. Total Hours per Semester [12] **(*NOAD$_{sem}$* + *NOSI$_{sem}$*)**	**75**
3.6. No. of hours / ECTS	**25**
3.7. Number of credits[13]	**3**

4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum) [14]	-
4.2. Competencies	-

5. Conditions (wherever applicable)

5.1. For course/lectures [15]	- Video Projector / Smartboard / White board
5.2. For practical activities (lab/sem/pr/other) [16]	- Computers with the R and Rstudio software installed

6. Learning outcomes [17]

Number of credits assigned to the discipline: 3				
Learning outcomes				Credit allocation based on learning outcomes
No.	Knowledge	Aptitudes	Responsibility and autonomy	
LO 1	The student/graduate analyzes, evaluates, and utilizes concepts, theories and methods from other fields in the field of Biology.	The student/graduate achieves transdisciplinary integration of knowledge in order to assess the carrying capacity of biological systems for socio-economic systems.	The student/graduate demonstrates initiative and self-control, the ability to anticipate and forward-thinking, courage, and persistence in achieving goals.	1
LO 2	The student/graduate accurately applies fundamental concepts in the field of Biology in various contexts.	The student/graduate uses, investigates, and critically analyzes the principles of operation and use of equipment/instruments, techniques/working methods for investigating the functioning of biological systems.	The student/graduate demonstrates negotiation, empathy, and assertive communication skills, leadership, teamwork, conflict management, team management, and public speaking skills.	1
LO 3	The student/graduate defines, explains, and exemplifies basic and modern experimental techniques in the analysis and characterization of biological systems, records and presents experimental results, and explains the principles of scientific methods.	The student/graduate uses, investigates, and critically analyzes the principles of operation and use of equipment/instruments, techniques/working methods for investigating the functioning of biological systems.	The student/graduate applies the knowledge learned in other courses to explain the interactions of organisms with the environment.	1

7. Course objectives (resulted from developed competencies)

7.1. Main course objective	To understand and demonstrate basic elements of biostatistics
7.2. Specific course objectives	To understand and demonstrate the use of statistical tests and regression analysis

8. Course description

8.1. Lecture[18]		**Teaching methods** [19]	**Hours**
Lecture 1	Introduction in R	Interactive lecture, explanation, conversation, problematisation	2
Lecture 2	Surface and volume method – theorethical aspects	Interactive lecture, explanation, conversation, problematisation	2
Lecture 3	Hypothesis testing	Interactive lecture, explanation, conversation, problematisation	2
Lecture 4	Experimental design - ANOVA	Interactive lecture, explanation, conversation, problematisation	2
Lecture 5	Regression	Interactive lecture, explanation, conversation, problematisation	2
Lecture 6	Statistics in research	Interactive lecture, explanation, conversation, problematisation	2
Lecture 7	The use of software in biology and ecology	Interactive lecture, explanation, conversation, problematisation	2
		Total lecture hours:	**14**

8.2. Practical activities

8.2.b. Laborator		**Teaching methods** [20]	**Hours**
Laboratory 1	Introduction in R	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 2	Surface and volume method	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 3	Hypothesis testing – T-test	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 4	Hypothesis testing : ANOVA	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 5	Regression	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 6	Correlation	Explanation of working methods, material examination, discussion, soft-ware applications	2
Laboratory 7	Practical Colloquium	Explanation of working methods, material examination, discussion, soft-ware applications	2
		Total laboratory hours	14

9. Bibliography

9.1. Recommended references	Crawley, M. J. (2012). *The R book*. John Wiley & Sons.
	Bedogni, G. (2010). A Beginner's Guide to R.
	Beckerman, A. P., Childs, D. Z., & Petchey, O. L. (2017). *Getting started with R: an introduction for biologists*. Oxford University Press.
	Zuur, A. F., Ieno, E. N., & Meesters, E. H. (2009). *A Beginner's Guide to R* (Vol. 150). New York: Springer.
	McCune, B., & Grace, J. B. (2002). *Analysis of ecological communities*.
9.2. Additional references	

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program [21]

In order to develop the content and choose the teaching/learning methods, the discipline's title holders organized an annual meeting with the teaching staff of the Faculty of Sciences, representatives of the business environment in Sibiu county, and other teaching staff in the field who hold positions at other higher education institutions. The meeting aimed to identify the needs and expectations of employers in the field and to ensure coordination with similar programs from other higher education institutions

11. Evaluation

Activity Type	11.1 Evaluation Criteria	11.2 Evaluation Methods		11.3 Percentage in the Final Grade	Notes.[22]
11.4a Exam / Coloquium	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester [23]:	%	50 % (minimum 5)	
		Homework:	%		
		Other activities[24]:	%		
		Final evaluation:	100% (min. 5)		
11.4b Seminar	• Frequency/relevance of participation or responses	Evidence of participation, portfolio of papers (reports, scientific summaries)		% (minimum 5)	
11.4c Laboratory	• Knowledge of the equipment, how to use specific tools; evaluation of tools, processing and interpretation of results	• Oral response • Written questionnaire • Laboratory notebook, experimental works, reports, etc. • Practical demonstration		50% (minimum 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		% (minimum 5)	
11.5 Minimum performance standard[25]					

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_|_7_| / |_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	Lecturer Ioan Tăușan, 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] *Equal to 14 weeks x number of hours from point 3.1 (similar to 3.2.a.b.c.)*
[8] *The following lines refer to individual study; the total is completed at point 3.7.*
[9] *Between 7 and 14 hours*
[10] *Between 2 and 6 hours*
[11] *The sum of the values from the previous lines, which refer to individual study.*
[12] *The sum (3.5.) between the number of hours of direct teaching activity (NOAD) and the number of hours of individual study (NOSI) must be equal to the number of credits assigned to the discipline (point 3.7) x no. hours per credit (3.6.)*
[13] *The credit number is computed according to the following formula, being rounded to whole neighbouring values (either by subtraction or addition*

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

Where:

- NOCpSpD = Number of lecture hours / week / discipline for which the credits are calculated
- NOApSpD = Number of application hours (sem./lab./pro.) / week / discipline for which the credits are calculated
- TOCpSdP = Total number of course hours / week in the Curriculum
- TOApSdP = Total number of application hours (sem./lab./pro.) / week in the Curriculum
- C_C/C_A = Course coefficients / applications calculated according to the table

Coefficients	**Course**	**Applications (S/L/P)**
Bachelor	2	1
Master	2,5	1,5
Bachelor - foreign language	2,5	1,25

[14] *The courses that should have been previously completed or equivalent will be mentioned*
[15] *Board, video projector, flipchart, specific teaching materials, online platforms, etc.*
[16] *Computing technology, software packages, experimental stands, online platforms, etc.*
[17] *The learning outcomes will be stated in accordance with the specific standards of the ARACIS expert commissions (https://www.aracis.ro/ghiduri/)*
[18] *Chapter and paragraph titles*
[19] *Exposition, lecture, board presentation of the studied topic, use of video projector, discussions with students (for each chapter, if applicable)*
[20] *Practical demonstration, exercise, experiment*
[21] *The relationship with other disciplines, the usefulness of the discipline on the labour market*
[22] *CPE – Conditions Exam Participation; nCPE – Does Not Condition Exam Participation; CEF - Conditions Final Evaluation; N/A – not applicable*
[23] *The number of tests and the weeks in which they will be taken will be specified*
[24] *Scientific circles, professional competitions, etc.*
[25] *The minimum performance standard in the competence grid of the study program is customized to the specifics of the discipline, if applicable*