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	Basic genetics			Code	FSTI.MFE.BIOEN.L.FO.4.2110.E-3.3
2.2. Course coordinator	Lector univ. dr. Ioana Boeraș				
2.3. Seminar / laboratory coordinator	Lector univ. dr. Ioana Boeraș				
2.4. Year of study[2]	2	**2.5.** Semester[3]	2	**2.6.** Evaluation form [4]	E
2.7. Course type [5]	R	**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
2	1	1			**4**
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]
28	14	14			**56**

Time Distribution for Individual Study [8]	**Hours**
Learning by using course materials, references and personal notes	3
Additional learning by using library facilities, electronic databases and on-site information	3
Preparing seminars / laboratories, homework, portfolios and essays	2
Tutorial activities [9]	7
Exams[10]	4

3.3. Total Individual Study Hours [11] ***(NOSI$_{sem}$)***	**19**
3.4. Total Hours in the Curriculum (*NOAD$_{sem}$*)	**56**
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]	- Students have to sign up with their institutional e-mail on Google Classroom - Classrooms need to be equiped with videoprojector and blackboard
5.2. For practical activities (lab/sem/pr/other) [16]	- Students have to sign up with their institutional e-mail on Google Classroom - Students read the preparatory materials offered by the professor - Classrooms need to be equiped with videoprojector and blackboard

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 describes, defines, and discusses fundamental principles in the field of biology, as well as interdisciplinary aspects (e.g., evolutionism, general ecology, plant physiology, animal physiology).	The student/graduate applies working methods using modern instruments/equipment and classical laboratory techniques to perform, design experiments, record and analyze appropriately the results obtained.	The student/graduate uses their own knowledge and experience to develop the scientific community and society in general by participating in professional and/or community activities	1
LO 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	The student/graduate defines, describes, discusses/presents the 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 biotechnological products, making ethical and professional decisions within the scientific process.	1

	functioning of living matter.			
LO 3			The student/graduate demonstrates the ability to operate with appropriate methods of information/ documentation/knowledge and instructs pupils, colleagues, students, and other persons in a scientific manner.	1

7. Course objectives (resulted from developed competencies)

7.1. Main course objective	To present the key concepts, principles and processes of genetics
7.2. Specific course objectives	O1. Define basic genetic concepts. O2. Describe the structure and function of the genetic material. O3. Describe the processes underlying hereditary transmission of characters. O4. Apply the laws of ereditary transmission to monohybrid and dihybrid crosses. O4. Highlighting how the genetic material change under the influence of the natural and artificial factors; presentation of the main groups of mutagens and their mode of action.

8. Course description

8.1. Lecture[18]		**Teaching methods** [19]	**Hours**
Lecture 1	Genetic material: Nucleic acids – DNA, RNA - their structure and role in heredity.	Lecture, explanation, conversation.	4
Lecture 2	Biochemical coding and genetic control - replication transcription, translation; genetic regulation.	Lecture, explanation, conversation, analysis of models, presentation of genetic structures and processes	4
Lecture 3	Mendelian inheritance. Mendelian laws of segregation and other segregation patterns.	Lecture, explanation, conversation.	4
Lecture 4	Citogenetics: Cell division and genetic recombination in procariotes and eucariotes	Lecture, explanation, conversation, analysis of models, presentation of genetic structures and processes	4
Lecture 5	Chromosome theory of heredity and genetic mapping	Lecture, explanation, conversation.	2
Lecture 6	Sex inheritance. Sex chromosomes and sex-linked inheritance.	Lecture, explanation, conversation.	2
Lecture 7	Extra-nuclear inheritance in eucariotes – genes in mitochondria and plastides	Lecture, explanation, conversation.	2
Lecture 8	Mutations – clasification, molecular mechanism, mutagenesis and mutagic agents	Lecture, explanation, conversation.	2
Lecture 9	Morphological and numerical alterations of chromosomes	Lecture, explanation, conversation.	4
		Total lecture hours:	**28**

8.2. Practical activities

8.2.a. Seminar		**Teaching methods** [20]	**Hours**
Seminar 1	Mendelian inheritance – the monohybrid cross	Explanation of working methods, exercises	2
Seminar 2	Cytogenetics *Cytogenetics of plants* - Chromosome staining in plants; Mitotic index calculation	Explanation of working methods, exercises	2
Seminar 3	Numerical alteration of the genetic matherial – poliploidy: methods to induce poliploidy; methods for ploidy analysis	Explanation of working methods, exercises	2
Seminar 4	Quantitative and qualitative traits- introduction in quantitative genetics	Explanation of working methods, exercises	2
Seminar 5	Linkage and genetic recombination	Explanation of working methods, exercises	2
Seminar 6	Bacterial genetics	Explanation of working methods, exercises	2
Seminar 7	Genetics of sex determination	Explanation of working methods, exercises	2
		Total seminar hours	14

8.2.b. Laborator		**Teaching methods** [21]	**Hours**
Laboratory 1	Mendelian inheritance – the dihybrid and trihybrid cross	Explanation of working methods, exercises	2
Laboratory 2	*Cytogenetics of animals* - Chromosome staining in animals *Human chromosomes, normal and modiffied human cariotype; sexual chromatine.*	Explanation of working methods, exercises	2
Laboratory 3	Genetic maps - Chromosome Mapping in Eukaryotes	Explanation of working methods, exercises	2
Laboratory 4	Genom– structure and polymorphysm	Explanation of working methods, exercises	2
Laboratory 5	Mutations	Explanation of working methods, exercises	2
Laboratory 6	Extra-nuclear heredity	Explanation of working methods, exercises	2
Laboratory 7	Oral examination	Exercises	2
		Total laboratory hours	14

9. Bibliography

9.1. Recommended references	Lewin, Benjamin, 2007. "Genes IX". Jones Bartlett Publishers.
	Russell P.J., 2006. Genetics: A Mendelian Approach. Pearson/Benjamin Cummings. Snyder, Larry, Wendy Champness, 1997. Molecular Genetics of Bacteria.
	Hartl, Daniel L., Elizabeth W. Jones, 1997. Genetics: Principles and Analysis, 4th Edition.
	Klug, William S., Michael R. Cummings, Charlotte A. Spencer, Michael A. Palladino, 2009. Concepts of Genetics. Benjamin Cummings, Cloth.
	Hammersmith R. L., Thomas R. Mertens, 2006. Genetics Laboratory Investigations, 13th Edition, Benjamin-Cummings Publishing Company.
9.2. Additional references	Griffiths, Anthony J. F., Jeffrey H. Miller, David T. Suzuki, Richard C. Lewontin, William M. Gelbart, 2000. An Introduction to Genetic Analysis. 7th ed. New York: W. H. Freeman.
	Friedberg, E.C., Graham C. Walker, Wolfram Siede, Richard D. Wood, 2005. DNA Repair and Mutagenesis. American Society for Microbiology Press.

10. Conjunction of the discipline's content with the expectations of the epistemic community, professional associations and significant employers of the specific study program [22]

Periodic interaction with the concerned organizations in order to correlate the course professional competencies and objectives with what is required in the work force.

11. Evaluation

Activity Type	11.1 Evaluation Criteria	11.2 Evaluation Methods		11.3 Percentage in the Final Grade	Notes.[23]
11.4a Exam / Coloquium	• Theoretical and practical knowledge acquired (quantity, correctness, accuracy)	Tests during the semester [24]:	%	80% (minimum 5)	
		Homework:	%		
		Other activities[25]:	%		
		Final evaluation:	80% (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		20% (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[26] Define the genetic material, its structure and function and understand the laws of heredity and apply them to monohybrid and dihybrid crosses.					

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	Lector univ. dr. Ioana Boeraș	
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] *Discussions, debates, presentations and/or analyses of papers, solving exercises and problems*
[21] *Practical demonstration, exercise, experiment*
[22] *The relationship with other disciplines, the usefulness of the discipline on the labour market*
[23] *CPE – Conditions Exam Participation; nCPE – Does Not Condition Exam Participation; CEF - Conditions Final Evaluation; N/A – not applicable*
[24] *The number of tests and the weeks in which they will be taken will be specified*
[25] *Scientific circles, professional competitions, etc.*
[26] *The minimum performance standard in the competence grid of the study program is customized to the specifics of the discipline, if applicable*