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	General genetics		Code	FSTI.MFE.BIOEN.L.SA.5.2110.C-5.7	
2.2. Course coordinator	Lecturer Ioana Boeraș, PhD				
2.3. Seminar / laboratory coordinator	Lecturer Ioana Boeraș, PhD				
2.4. Year of study[2]	3	**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
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	28
Additional learning by using library facilities, electronic databases and on-site information	9
Preparing seminars / laboratories, homework, portfolios and essays	14
Tutorial activities [9]	14
Exams[10]	4

3.3. Total Individual Study Hours [11] ***(NOSI$_{sem}$)***	**69**
3.4. Total Hours in the Curriculum (*NOAD$_{sem}$*)	**56**
3.5. Total Hours per Semester [12] **(*NOAD$_{sem}$* + *NOSI$_{sem}$*)**	**125**
3.6. No. of hours / ECTS	**25**
3.7. Number of credits[13]	**5**

4. Prerequisites (if needed)

4.1. Courses that must be successfully completed first (from the curriculum) [14]	Basic genetics
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: 5				
Learning outcomes				Credit allocation based on learning outcomes
No.	Knowledge	Aptitudes	Responsibility and autonomy	
LO 1			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.	5

7. Course objectives (resulted from developed competencies)

7.1. Main course objective	To provide students with the ability to understand normal and pathological mechanisms of heredity and the principles of storying and expessing the genetic material.
7.2. Specific course objectives	O1. To define the structure and function of the genetic material. O2. To identify the mendelian mechanisms of heredity in eredopathology. O3. To describe the distribution and frequency of genes in the human population and the factors that determine this distribution. O4. To identify and define genetic and congenital disease.

8. Course description

8.1. Lecture[18]		**Teaching methods** [19]	**Hours**
Lecture 1	The DNA structure, replication and distribution in new cells during cell divission.	Discussion, practical demonstration, exercise, experiment	2
Lecture 2	Transcription, the genetic code and translation	Discussion, exercise, experiment	2
Lecture 3	The complex relation between genes and traits: interalellic relationships.	Discussion, practical demonstration, exercise, experiment	2

Lecture 4	The complex relation between genes and traits: modes of gene expression, pleiotropy and polyplody.	Discussion, practical demonstration, experiment	2
Lecture 5	The human genome, its structure and orgin.	Discussion, exercise, experiment	2
Lecture 6	Transposons, mitochindrial DNA and organelle DNA transmission.	Discussion, practical demonstration	2
Lecture 7	Meiosis and variation in the number of chromosomes – monosomies and trisomies.	Discussion, exercise	2
Lecture 8	Chromosomal structural anomalies	Discussion, practical demonstration	2
Lecture 9	Monogenetic diseases: autosomal dominant and autosomal recessive.	Discussion, practical demonstration, exercise	2
Lecture 10	Monogenetic diseases – x-linked. Polifactorial disease.	Discussion, exercise	2
Lecture 11	Congenital diseases and terathogens. Genetic disease profilaxy and genetic screening.	Discussion, exercise	2
Lecture 12	Gene expression in prokaryotes.	Discussion, exercise	2
Lecture 13	Gene expression in eukaryotes: transcription.	Discussion, practical demonstration, exercise,	2
Lecture 14	Gene expression in eukaryotes: posttranscriptional mechanisms.	Discussion, practical demonstration, exercise,	2
		Total lecture hours:	

8.2. Practical activities

8.2.a. Seminar		**Teaching methods [20]**	**Hours**
Seminar 1	Mendelian inheritance and monohibrid and dihibrid crosses.	Discussion, practical demonstration, exercise	2
Seminar 2	Gene relations when determining the characters: expercises to determine phenotypes from known genotypes.	Discussion, practical demonstration, exercise	2
Seminar 3	Methods for the study of chromosomes, chromosome classification.	Discussion, practical demonstration, exercise	2
Seminar 4	Staining methods for the study of chromosomes: G bading, R banding, T banding., C banding, NOR banding, modern techniques.	Discussion, practical demonstration, exercise	2
Seminar 5	Monogenic inheritance, mendelian genetics, pedigree analysis.	Discussion, practical demonstration, exercise	2
Seminar 6	Multifactorial diseases – cancer as a case study	Discussion, practical demonstration, exercise	2
Seminar 7	Gene expression in eukaryotes: transcriptional control through transcription factors – case study	Discussion, practical demonstration, exercise	2
		Total seminar hours	14

8.2.b. Laborator		**Teaching methods [21]**	**Hours**
Laboratory 1	Mendelian inheritance and monohibrid and dihibrid crosses.	Discussion, practical demonstration, exercise	2
Laboratory 2	Gene relations when determining the characters: expercises to determine phenotypes from known genotypes.	Discussion, practical demonstration, exercise	2
Laboratory 3	Human karyotype analysis: normal karyotype	Discussion, practical demonstration, exercise	2
Laboratory 4	Human karyotype analysis: abnormal karyotypes.	Discussion, practical demonstration, exercise	2

Laboratory 5	Pedigree analysis for the determination of monogenic disease transmission patterns.	Discussion, practical demonstration, exercise	2
Laboratory 6	Gene expression in prokaryotes: Lac operon and its aplications.	Discussion, practical demonstration, exercise	2
Laboratory 7	Final recap and oral evaluation	Exercise	2
		Total laboratory hours	14

9. Bibliography

9.1. Recommended references	Nussbaum R, McInnes R, Willard H, 2007, Thompson and Thompson Genetics in Medicine 7th edition, Saunders Elsevier
	Pierce B. A. 2014, Genetics a conceptual approach, 5th edition, W. H. Freeman and company
	Online Mendelian Inheritance in Man http:// www.ncbi.nih.gov. OMIM
9.2. Additional references	Marchian Sanda, Atasie Diter, 2014 - Indrumator de lucrari practice, Ed. ULBS.
	Mircea Covic, D. Stefanescu, I. Sandovici, 2004 - Genetica Medicală, Ed. Polirom.
	Marchian Sanda, 2001 - Genetica Medicala , Ed. ULBS.

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:	15%		
		Other activities[25]:	%		
		Final evaluation:	65% (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] Ability to define basic human genetics therms, describe the structure and function of the human genetic material and the rules governing hereditary transmission of genetic diseases.	

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	Lecturer Ioana Boeraș, 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] *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*