

## SYLLABUS

Academic year 2023 - 2024

### 1. Details about the program

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. Study cycle <sup>1</sup>	Bachelor
1.6. Specialization	Biology

### 2. Details about the course

2.1. Course name	<b>Animal cytology with notions of cell biology</b>	Code	FSTI.MFE.BIOEN.L. FO.1.2020.E-5.4
2.2. Course coordinator	Lector Dr. Boeraş Ioana		
2.3. Practical activity coordinator	Lector Dr. Boeraş Ioana		
2.4. Year of study <sup>2</sup>	1	2.5. Semester <sup>3</sup>	1
2.6. Type of assessment <sup>4</sup>	Exam		
2.7. Type of discipline <sup>5</sup>	O	2.8. Formative category of the discipline <sup>6</sup>	F

### 3. Estimated total time

3.1. Proportion of the discipline within the curriculum – <i>number of hours / week</i>					
3.1.a.Lecture	3.1.b. Seminar	3.1.c. Laboratory	3.1.d. Project	3.1.e Other	Total
2		2			4
3.2. Proportion of the discipline within the curriculum – <i>number of hours / week</i>					
3.2.a.Lecture	3.2.b. Seminar	3.2.c. Laboratory	3.2.d. Project	3.2.e Other	Total <sup>7</sup>
28		28			56
<b>Allocation of time budget for individual study<sup>8</sup></b>					<b>No. hours</b>
Study based on textbook, lecture notes, bibliography and course notes					28
Additional research: library, specialized electronic platforms and field or on-site investigation and documentation					11
Preparing for the seminar / laboratorires, home assignments, reports, portfolios and essays					14
Tutoring <sup>9</sup>					14
Examinations <sup>10</sup>					2
<b>3.3. Total number of hours for individual study<sup>11</sup> (NOS<sub>Isem</sub>)</b>					<b>69</b>
<b>3.4. Total number of hours in the curriculum (NOAD<sub>sem</sub>)</b>					<b>56</b>
<b>3.5. Total number of hours per semester<sup>12</sup> (NOAD<sub>sem</sub> + NOS<sub>Isem</sub>)</b>					<b>125</b>
<b>3.6. No of hours / ECTS</b>					<b>25</b>
<b>3.7. Number of credits<sup>13</sup></b>					<b>5</b>

#### 4. Prerequisites (if applicable)

4.1. Prerequisite courses for enrollment to this subject (from the curriculum) <sup>14</sup>	
4.2. Competencies	

#### 5. Requirements (wherever applicable)

5.1. Lecture organization and structure <sup>15</sup>	<ul style="list-style-type: none"> <li>- Videoprojector</li> <li>- Students need to sign up with Google Classroom using their ULBS e-mail</li> </ul>
5.2. Organization and structure of practical activities (lab/sem/pr/other) <sup>16</sup>	<ul style="list-style-type: none"> <li>- Videoprojector</li> <li>- Blackboard</li> <li>- Students need to sign up with Google Classroom using their ULBS e-mail</li> </ul>

#### 6. Specific competencies<sup>17</sup>

		Number of credits assigned to the discipline <sup>18</sup>	Distribution of credits according to competencies <sup>19</sup>
<b>6.1. Professional competencies</b>	CP1	To identify the structure and function of cellular organelles	1
	CP2	To define notions relating to metabolism: anabolism – photosynthesis, protein synthesis and catabolism – respiration	1
	CP3	To define mitosis and meiosis	1
	CP4	To explain the concepts the cell as an osmotic system and the structural, functional and informational unit of life	1
	CP5	To identify the subcellular structures involved in metabolism and heredity	1
<b>6.2. Transversal competencies</b>	CT1	To carry out a laboratory experiment – planning, making the reagents, executing and interpreting the results	
	CT2	To identify and organize relevant bibliography for a given subject	
	CT3	Positive attitude for a conscious and active study of Biology	

#### 7. Course objectives (reflected by the framework of specific competencies)

7.1. General objective	The study of cellular structures, biochemical and physiological processes that underlie life.
7.2. Specific objectives	<p>O1. To identify cellular organelles and to distinguish a plant cell from an animal cell based on the differences in structure</p> <p>O2. To define the functions of cellular organelles and to explain how structure determines function</p> <p>O3. To emphasize the universal character of the cellular system</p> <p>O4. To demonstrate the role of cellular structures in molecular mechanisms of heredity</p> <p>O5. To identify the cellular metabolic processes required to generate energy for the survival of living organisms.</p>

#### 8. Course description

8.1. Lecture <sup>20</sup>	Teaching methods <sup>21</sup>	No. of hours
Lecture 1 The cell – the basic unit of life	Oral presentation, demonstration on the blackboard, discussions with the students	2



Lecture 2 Macromolecules: sugars, lipids, proteins, nucleic acids	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 3 The nucleus – structure and function	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 4 Nuclear chromatin, DNA, ARN, genes and chromosomes	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 5 Protein synthesis	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 6 Cell compartmentalization and transport between compartments.	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 7 Endoplasmic reticulum and the Golgi apparatus	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 8 Physiological function of cellular organelles – lysosomes and intracellular digestion	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 9 Plasma membrane and transport across the membrane	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 10 Extracellular matrix, the cytoskeleton and extensions of the cell	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 11 Cell signaling and the cell cycle	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 12 Cell division	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 13 Metabolism: mitochondria and cellular respiration	Oral presentation, demonstration on the blackboard, discussions with the students	2
Lecture 14 Metabolism: the chloroplast and photosynthesis	Oral presentation, demonstration on the blackboard, discussions with the students	2
<b>Total number of lecture hours:</b>		<b>28</b>

<b>8.2. Practical activities</b> (8.2.a. Seminar <sup>22</sup> / 8.2.b. Laboratory <sup>23</sup> / 8.2.c. Project <sup>24</sup> / 8.2.d. Other practical activities <sup>25</sup> )	<b>Teaching methods</b>	<b>No. of hours</b>
Act.1 Study methods in cell biology: optical microscope, observation of different cell types under the microscope	Practical demonstration, exercise, experiment	4

Act.2 DNA extraction from epithelial cells from the oral cavity	Experiment	4
Act.3 Protein structure, protein denaturation with acids	Practical demonstration, exercise, experiment	4
Act.4 Diffusion and osmosis. Observing turgescence and plasmolyzed plant cell	Practical demonstration, exercise, experiment	4
Act.5 Cell counting using a hemocytometer: determining the number of erythrocytes in a milliliter of blood	Practical demonstration, exercise, experiment	4
Act.6 Laboratory techniques, molar concentrations, making solutions and dilutions	Practical demonstration, exercise, experiment	4
Act.7 Aerobic respiration (protozoa) and anaerobic respiration (yeast)	Practical demonstration, exercise, experiment	2
Act.8 Final recap and oral evaluation	Exercise	2
<b>Total number of hours: seminar/laboratory</b>		<b>28</b>

## 9. Bibliography

9.1. Recommended references	Cain ML, Reece JB, Urry LA, Wasserman SA, Minorsky PV, 2016, Campbell biology 11th edition, Pearson.
	Alberts B, Johnson A, Lewis J, 2014, Molecular biology of the cell 6th edition, W. W. Norton & Company
9.2. Additional references	

## 10. Correlating the course description with the expectations and requirements of representatives of the epistemic community, professional associations and significant employers and stakeholders related to the study program and the specific area<sup>26</sup>

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. Evaluate

Type of activity	11.1 Assessment criteria	11.2 Assessment methods		11.3 Percentage of the final grade	Notes. <sup>27</sup>
11.4a Exam / Colloquium	<ul style="list-style-type: none"> <li>Theoretical and practical knowledge (quantity, correctness, accuracy)</li> </ul>	Midterm / ongoing assignments <sup>28</sup> :	%	70% (minimum 5)	
		Home assignments: assay on the structure and function of a cell organelle	10%		
		Other activities <sup>29</sup> :	%		
		Final assessment: multiple choice test	60% (min. 5)		
11.4b Seminar	<ul style="list-style-type: none"> <li></li> </ul>				
11.4c Laboratory	<ul style="list-style-type: none"> <li>Knowledge of equipment, methods of using specific instruments and tools; assessment of tools or achievements, processing and interpretation of results</li> </ul>	<ul style="list-style-type: none"> <li>Oral examination</li> <li>Laboratory notebook, experimental work, scientific papers, etc.</li> <li>Practical demonstrations</li> </ul>		30% (minimum 5)	
11.4d Project	<ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li></li> </ul>			
11.5 Minimum performance standard <sup>30</sup>					

Ability to identify cellular organelles, to determine their function and to explain the metabolic processes that generate energy for the functioning and survival of the cell and therefore all living organisms.	
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***The course description includes components adapted to SEN (Special Educational Needs) persons, according to their type and degree, at all curricular elements and dimensions (competencies, objectives, course description, teaching methods, alternative assessment), in view of providing and ensuring equitable and fair opportunities to academic education for all students, with special attention to special educational needs.***

Date of submission: |\_2\_|\_5\_| / |\_0\_|\_9\_| / |\_2\_|\_0\_|\_2\_|\_3\_|

Date of approval in the Department: |\_1\_|\_9\_| / |\_1\_|\_0\_| / |\_2\_|\_0\_|\_2\_|\_3\_|

	Degree, title, first name, surname	Signature
<b>Course coordinator</b>	Lecturer PhD. Ioana Boeraş	
<b>Study program coordinator</b>	Assoc. Prof. Ana-Maria Benedek-Sîrbu, PhD	
<b>Director Departament</b>	Lecturer PhD. Voichița GHEOCA	

<sup>1</sup> Licență / Master

<sup>2</sup> 1-4 pentru licență, 1-2 pentru master

<sup>3</sup> 1-8 pentru licență, 1-3 pentru master

<sup>4</sup> Examen, colocviu sau VP A/R – din planul de învățământ

<sup>5</sup> Regim disciplină: O=Disciplină obligatorie; A=Disciplină opțională; U=Facultativă

<sup>6</sup> Categoria formativă: S=Specialitate; F=Fundamentală; C=Complementară; I=Asistată integral; P=Asistată parțial; N=Neasistată

<sup>7</sup> Este egal cu 14 săptămâni x numărul de ore de la punctul 3.1 (similar pentru 3.2.a.b.c.d.e.)

<sup>8</sup> Liniile de mai jos se referă la studiul individual; totalul se completează la punctul 3.37.

<sup>9</sup> Între 7 și 14 ore

<sup>10</sup> Între 2 și 6 ore

<sup>11</sup> Suma valorilor de pe liniile anterioare, care se referă la studiul individual.

<sup>12</sup> 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 alocate disciplinei (punctul 3.7) x nr. ore pe credit (3.6.)

<sup>13</sup> Numărul de credite se calculează după formula următoare și se rotunjește la valori vecine întregi (fie prin micșorare fie prin majorare)

$$\text{Nr. credite} = \frac{\text{NOCpSpD} \times C_c + \text{NOApSpD} \times C_A}{\text{TOCpSdP} \times C_c + \text{TOApSdP} \times C_A} \times 30 \text{ credite}$$

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<sub>c</sub>/C<sub>A</sub> = 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

<sup>14</sup> Se menționează disciplinele obligatoriu a fi promovate anterior sau echivalente

<sup>15</sup> Tablă, videoproiector, flipchart, materiale didactice specifice, platforme on-line etc.

<sup>16</sup> Tehnică de calcul, pachete software, standuri experimentale, platforme on-line etc.

<sup>17</sup> Competențele din Grilele aferente descrierii programului de studii, adaptate la specificul disciplinei

<sup>18</sup> Din planul de învățământ

<sup>19</sup> Creditele alocate disciplinei se distribuie pe competențe profesionale și transversale în funcție de specificul disciplinei

<sup>20</sup> Titluri de capitole și paragrafe

<sup>21</sup> Expunere, prelegere, prezentare la tablă a problematicii studiate, utilizare videoproiector, discuții cu studenții (pentru fiecare capitol, dacă este cazul)

<sup>22</sup> Discuții, dezbateri, prezentare și/sau analiză de lucrări, rezolvare de exerciții și probleme etc.

<sup>23</sup> Demonstrație practică, exercițiu, experiment etc.

<sup>24</sup> Studiu de caz, demonstrație, exercițiu, analiza erorilor etc.

<sup>25</sup> Alte tipuri de activități practice specifice

<sup>26</sup> Legătura cu alte discipline, utilitatea disciplinei pe piața muncii

<sup>27</sup> CPE – condiționează participarea la examen; nCPE – nu condiționează participarea la examen; CEF - condiționează evaluarea finală; N/A – nu se aplică

<sup>28</sup> Se va preciza numărul de teste și săptămânile în care vor fi susținute.

<sup>29</sup> Cercuri științifice, concursuri profesionale etc.

<sup>30</sup> Se particularizează la specificul disciplinei standardul minim de performanță din grila de competențe a programului de studii, dacă este cazul.