

## SYLLABUS

Academic year 2024 - 2025

### 1. Program data

|                                    |   |
|------------------------------------|---|
| 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 Sport |
| 1.4. Field of study                | Biology   |
| 1.5. Cycle of studies <sup>1</sup> | License   |
| 1.6. Specialization                | Biology   |

### 2. Discipline data

|                                     |                                    |  |             |  |             |
|-------------------------------------|------------------------------------|--|-------------|--|-------------|
| 2.1. Name of the discipline         | <b>Human Histology and Anatomy</b> |  | C<br>o<br>d | FSTI. MFE. BIORO.<br>L.FO.2.2020.E-3.5 |             |
| 2.2. Course Activities Holder       | Dr. Brînza Ion                     |  |             |  |             |
| 2.3. Holder of practical activities | Dr. Brînza Ion                     |  |             |  |             |
| 2.4. Year of study <sup>2</sup>     | 1                                  | 2.5. Semester <sup>3</sup>                             | 2           | 2.6. Type of assessment <sup>4</sup>   | Examination |
| 2.7. Discipline regime <sup>5</sup> | A                                  | 2.8. Formative category of the discipline <sup>6</sup> | S           |  |             |

### 3. Total estimated time

|   |                |                   |                |                     |
|---|----------------|-------------------|----------------|---------------------|
| 3.1. Extension of the subject in the curriculum – number of hours per week                    |                |                   |                |                     |
| 3.1.a.Course  | 3.1.b. Seminar | 3.1.c. Laboratory | 3.1.d. Project | Total               |
| 2   |                | 2                 |                | <b>4</b>            |
| 3.2. Extension of the subject in the curriculum – Total hours in the curriculum               |                |                   |                |                     |
| 3.2.a.Course  | 3.2.b. Seminar | 3.2.c. Laboratory | 3.2.d. Project | Total <sup>7</sup>  |
| 28  |                | 28                |                | <b>56</b>           |
| <b>Distribution of the time fund for individual study<sup>8</sup></b>                         |                |                   |                | <b>No. of hours</b> |
| Study by textbook, course material, bibliography and notes                                    |                |                   |                | 9                   |
| Additional documentation in the library, on specialized electronic platforms and in the field |                |                   |                | 4                   |
| Preparation of seminars/laboratories, assignments, papers, portfolios and essays              |                |                   |                | 2                   |
| Tutoring <sup>9</sup>   |                |                   |                | 2                   |
| Examination <sup>10</sup>   |                |                   |                | 2                   |
| <b>3.3. Total hours allocated to individual study<sup>11</sup> (NOSI<sub>sem</sub>)</b>       |                |                   |                | <b>19</b>           |
| <b>3.4. Total hours of the Curriculum (NOAD<sub>sem</sub>)</b>                                |                |                   |                | <b>56</b>           |
| <b>3.5. Total hours per semester<sup>12</sup> (NOAD<sub>sem</sub> + NOSI<sub>sem</sub>)</b>   |                |                   |                | <b>75</b>           |
| <b>3.6. No. of hours / ECTS</b>   |                |                   |                | <b>25</b>           |
| <b>3.7. Number of credits<sup>13</sup></b>  |                |                   |                | <b>3</b>            |

#### 4. Preconditions (where applicable)

|  |  |
|--|--|
| 4.1. Subjects required to be previously passed (by curriculum) <sup>14</sup> |  |
| 4.2. Skills  |  |

#### 5. Conditions (where applicable)

|   |  |
|---|--|
| 5.1. Course Conduct <sup>15</sup>                                       | Classroom, equipped with laptop/desktop, video projector.  |
| 5.2. Carrying out practical activities (lab/sem/pr/aplic) <sup>16</sup> | Laboratory equipped with optical microscopes, slides and slides, biological material to be analyzed. |

#### 6. Specific skills gained<sup>17</sup>

|                                 |     | Number of credits allocated to the discipline <sup>18</sup>   | 3 | Distribution of appropriations by competence <sup>19</sup> |
|---------------------------------|-----|---|---|--|
| <b>6.1. Professional skills</b> | CP1 | Defining basic concepts, theories and methods in human histology and anatomy to facilitate the necessary connections with other subjects. |   | 0,3  |
|                                 | CP2 | Identification of the procedures, concepts and phenomena underlying the methods used in human histology and anatomy.                      |   | 0,3  |
|                                 | CP3 | The ability to communicate using the language specific to histology and anatomy, to explain the organization/structure of the human body. |   | 0,3  |
|                                 | CP4 | Demonstrating the unitary character of the human organism   |   | 0,3  |
|                                 | CP5 | Topographic location of organs, apparatus and systems in the general body cavity.   |   | 0,3  |
|                                 | CP6 | Identifying the structural elements of organs and organ systems in the human body.  |   | 0,3  |
|                                 | CP7 | The ability to analyze structures from the cellular level to the structure of apparatus, systems and the body.                            |   | 0,3  |
| <b>6.2. Skills Transverse</b>   | CT1 | The ability to put into practice the knowledge acquired through hygiene measures.   |   | 0,3  |
|                                 | CT2 | Accepting appropriate behavior to maintain the health of the body.  |   | 0,3  |
|                                 | CT3 | The ability to behave ethically.  |   | 0,3  |

#### 7. Objectives of the discipline (resulting from the grid of specific skills accumulated)

|                        |   |
|------------------------|---|
| 7.1. General objective | Acquisition by students of knowledge regarding the subsystemic structures of the human body starting from the subcellular, histological structures of organs, apparatuses, systems in close connection with their physiology and their preservation in optimal physiological conditions by observing the most basic rules of hygiene. |
|------------------------|---|



|                          |  |
|--------------------------|--|
| 7.2. Specific objectives | <ol style="list-style-type: none"> <li>1. To develop the capacity for exploration/investigation of the human body and to use the appropriate means and methods for its exploration.</li> <li>2. Recognition of different types of human cells and tissues in microscopic preparations.</li> <li>3. Making cytological and histological preparations, observing them under a microscope and making drawings of them.</li> </ol> |
|--------------------------|--|

## 8. Content

| 8.1. Course <sup>20</sup>  | Teaching methods <sup>21</sup>  | No. of hours |
|--|---|--------------|
| Course 1 Introduction, objectives of the discipline. <ul style="list-style-type: none"> <li>- Brief history;</li> <li>- Structure, functions and general classification of tissues in vertebrates;</li> <li>- Histogenesis;</li> <li>- The general organization of the human body;</li> <li>- Descriptive and topographic anatomy;</li> <li>- Classical and modern methods of anatomical study.</li> </ul>   | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 2            |
| Course 2 Integumentary system – epithelial tissue <ul style="list-style-type: none"> <li>- General;</li> <li>- Types of epithelia;</li> <li>- External morphology of the skin;</li> <li>- Skin layering;</li> <li>- Cutaneous appendages.</li> </ul>   | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 2            |
| Course 3 Bone system – connective tissues <ul style="list-style-type: none"> <li>- General;</li> <li>- Own connective cells and migratory cells;</li> <li>- The chemical composition of the fundamental substance, and the characterization of collagen, elastic and reticular connective fibers;</li> <li>- Classification and role of connective tissues;</li> <li>- Osteogenesis;</li> <li>- Bone morphology and structure;</li> <li>- Composition of the human skeleton, types of bones, adaptive peculiarities;</li> <li>- The skeleton of the human body.</li> </ul> | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 4            |
| Course 4 Muscular System <ul style="list-style-type: none"> <li>- Muscle tissue localization and classification;</li> <li>- Comparative characterization, both structural and ultrastructural, of skeletal striated muscle fiber, myocardocyte and smooth muscle cell;</li> <li>- Muscles of the human body;</li> <li>- Morphology and structure of skeletal muscles;</li> <li>- Appendices and levers of the locomotor system.</li> </ul>   | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 2            |
| Course 5 Somatic and Vegetative Nervous System <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Definition and organization of the nervous system;</li> <li>- Localization, neurogenesis and general structure (neurons and glial cells);</li> </ul>   | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities  | 4            |



|  |  |   |
|--|--|---|
| <ul style="list-style-type: none"> <li>- Description of permeable barriers in CNS;</li> <li>- The neuron, the nervous tissue;</li> <li>- Spinal cord and spinal nerves;</li> <li>- Encephalon (morphology and structure of the myelencephalon, metencephalon, midbrain, diencephalon, telencephalon);</li> <li>- Peripheral nervous system (spinal nerves and cranial nerves);</li> <li>- Vegetative nervous system (sympathetic and parasympathetic);</li> </ul>  | <p>carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).</p>  |   |
| <p>Course 6 Receiving Structures (Sense Organs)</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- cutaneous, kinesthetic, gustatory, olfactory, visual, acoustic-vestibular, visceral receptors;</li> </ul>   | <p>Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).</p> | 2 |
| <p>Course 7 Digestive System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Morphology and structure of the digestive tract;</li> <li>- The oral cavity (comprising the teeth and salivary glands);</li> <li>- Pharynx, esophagus, stomach, small intestine and large intestine, as well as the features of their wall;</li> <li>- Morphology and structure of the adnexal glands (parotid, sublingual, submandibular, parotid, liver and pancreas);</li> <li>- Splanhnopleura.</li> </ul> | <p>Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).</p> | 2 |
| <p>Course 8 Respiratory System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Morphology and structure of the airway wall (nasal passages, pharynx, larynx, trachea, bronchi);</li> <li>- Lung morphology and structure;</li> </ul>  | <p>Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).</p> | 2 |
| <p>Course 9 Circulatory System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Blood;</li> <li>- Hematopoiesis;</li> <li>- Analysis of the structure of hematopoietic tissues and organs in adults;</li> <li>- Heart (morphology, structure of the heart wall, cardiac compartments, vascularization and innervation);</li> <li>- Morphology and structure of blood vessels (arteries, veins and capillaries);</li> <li>- Distribution of the main blood vessels.</li> </ul>                | <p>Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).</p> | 2 |
| <p>Course 10 Lymphoid System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Lymph;</li> <li>- Morphology and structure of lymphoid vessels (veins and capillaries);</li> </ul>   | <p>Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities</p>  | 2 |



|   |   |           |
|---|---|-----------|
| <ul style="list-style-type: none"> <li>- Morphology and structure of primary lymphatic organs (bone marrow and thymus);</li> <li>- Morphology and structure of secondary lymphatic organs (lymph nodes, spleen and lymphoid formations associated with mucous membranes in tubular organs);</li> <li>- Distribution of the main lymphatic vessels.</li> </ul>                                     | carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.).  |           |
| <p>Course 11 Urinary System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Morphology and structure of the kidneys (cortex and renal marrow, nephron, vascularization of the kidneys);</li> <li>- Morphology and structure of the urinary tract (ureters, bladder, urethra).</li> </ul>   | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 2         |
| <p>Course 12 Genital System</p> <ul style="list-style-type: none"> <li>- Introduction and generalities;</li> <li>- Morphology and structure of the female genital system: ovaries, genital tracts (fallopian tubes, uterus, vagina), adnexal glands and external genitalia;</li> <li>- Morphology and structure of the male genital system: testicles and intratesticular sperm ducts.</li> </ul> | Video projector-assisted lecture; Systematic exposure; Didactic demonstration, debate and problematization; Interactive dialogue with students; Activities carried out on e-learning platforms (Google Classroom, Google Meet, Zoom, etc.). | 2         |
| <b>Total course 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> /<br>8.2.c. Project <sup>24</sup> )   | <b>Teaching methods</b>   | <b>No. of hours</b> |
|--|---|---------------------|
| Act.1 Preparation of biological tissues for microscopic analysis. Histological, histochemical and immunohistochemical techniques; quality and safety management in the animal histology laboratory; optical and electron microscopy concepts.  | Explanation, demonstration, graphic representation. Exercise. Video projection.                                 | 2                   |
| Act.2 Classification, localization and recognition of epithelial tissues. Covering epithelial tissues: simple and stratified, squamous, cubic and prismatic. Secretory epithelial tissues: exocrine and endocrine. Sensory epithelial tissues. Structure of the skin: sections through the skin (ensemble, detail - epidermis), skin glands (sweating, sebaceous). The hair, the nail.   | Explanation, demonstration, graphic representation. Exercise. Video projection. Observation under a microscope. | 2                   |
| Act.3 Observation of different types of connective tissues. Their classification according to the consistency of the fundamental substance and the proportion between the component elements. Highlighting and describing the connective tissues proper (soft), semi-hard (hyaline, elastic and fibrous cartilaginous tissue), hard (compact and spongy bone tissue) and liquid (blood). | Explanation, demonstration, graphic representation. Exercise. Video projection. Observation under a microscope. | 2                   |
| Act.4 Skeletal system. Bone morphology and structure. Axial skeleton.  | Explanation, demonstration, graphic representation. Exercise. Video projection. Work on the online simulator.   | 2                   |

|  |   |   |
|--|---|---|
| Act.5 The appendicular skeleton.   | Explanation, demonstration, graphic representation. Exercise. Video projection. Work on the online simulator.   | 2 |
| Act.6 Observation of different types of muscle tissues. Their classification. Highlighting and describing muscle tissues (striated, smooth, cardiac). Classification of muscles. The shape and size of skeletal muscles. Skeletal muscle appendages. Locomotor system levers | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.7 The nervous system. Structure of neurons, glial and nerve cells. Morphological and functional classification of neurons and neurillas. Clinical correlations. Highlighting the structure of some organs of the central nervous system.                                 | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.8 Receiving structures. Their classification according to: the specific excitant (mechanoreceptors, thermoreceptors, photoreceptors, chemoreceptors, nociceptors) and location (exteroceptors, proprioceptors, interoceptors). Highlighting the structure of the eye.    | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.9 Highlighting the morphology and structure of the digestive tract wall.   | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.10 Highlighting the morphology and structure of the airway and lung wall.  | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.11 Respiratory system: lungs, dissection and observation of tissue under a microscope  | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.12 Circulatory, arterial, venous and capillary systems. Highlighting the morphology and structure of the heart wall.   | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2 |
| Act.13 Lymphatic system. Highlighting lymphoid cells. Highlighting the morphology and structure of lymphoid organs.  | Explanation, demonstration, graphic representation. Exercise. Video projection. Observation under a microscope. Work on the online simulator.             | 2 |

|  |   |           |
|--|---|-----------|
| Act.14 Highlighting the morphology and structure of the kidneys and urinary tract. Highlighting the morphology and structure of the female genital system. Highlighting the morphology and structure of the male genital system. | Explanation, demonstration, graphic representation. Exercise. Video projection. Dissection. Observation under a microscope. Work on the online simulator. | 2         |
| <b>Total seminar/laboratory hours</b>  |   | <b>28</b> |

## 9. Bibliography

|   |  |
|---|--|
| 9.1. Recommended bibliographic references                   | Atlas of Anatomy of Man Netter (fifth edition), Ed. Callisto, 2012   |
|   | Gray's Anatomy for Students. Fourth edition, Richard L. Drake; WayneVogl; Adam W. M. Mitchel; Scientific consultancy for the Romanian edition: Prof Univ Dr. Florin Mihai Filipoiu, ed Prior, 2019 |
|   | Comănescu G., Leonov, S., Neagu, A. - N., Elements of Cytology, Histology and Animal Embryology, Media Publishing House, Bacău, 2001   |
|   | Anne M Gilroy, Brian R MacPherson, Jamie Wikenheiser, Michael Schuenke, Erik Schulte, Udo Schumacher - Atlas of Anatomy-Thieme, 2020   |
|   | Elaine N. Marieb, Suzanne M. Keller - Essentials of Human Anatomy & Physiology, 13th edition-Pearson, 2020   |
|   | Wojciech Pawlina - Histology A Text and Atlas With Correlated Cell and Molecular Biology 9th, 2023   |
|   | Lap Ki Chan, Wojciech Pawlina - Teaching Anatomy_ A Practical Guide-Springer , 2020  |
| 9.2. Additional bibliographic references                    | Beets Gordon J., Desaix P., Johnson E., et al., Anatomy and Physiology 2e, Rice University, Houston, Texas 77005, 2022   |
|   | Sandu, V.D., Pașca, C., Kis, E., 1999, Anatomia și igiena uomo, Presa Universitariă Clujeană, Cluj-Napoca.   |
|   | Zamfir Alexandra, 2000, Human Anatomy and Hygiene, Ed Alma Mater, Sibiu  |
|   | Frank H. Netter MD - Netter Atlas of Human Anatomy - Classic Regional Approach, 8th Ed.-Elsevier, 2023   |
|   | Wojciech Pawlina, Michael H. Ross - Histology_ A Text and Atlas_ With Correlated Cell and Molecular Biology-LWW Wolters Kluwer Health, 2019  |
| Werner Kahle - Color atlas of human anatomy. 3-Thieme, 2023 |  |

## 10. Corroborating the contents of the discipline with the expectations of the representatives of the epistemic community, professional associations and employers representative of the field related to the program<sup>25</sup>

It is carried out through periodic contacts with them in order to analyze the problem

## 11. Assessment

| Activity Type           | 11.1 Evaluation criteria   | 11.2 Evaluation methods             |               | 11.3 Weight of the final grade | Obs. <sup>26</sup> |
|-------------------------|--|-------------------------------------|---------------|--------------------------------|--------------------|
| 11.4a Exam / Colloquium | • Theoretical and practical knowledge acquired (quantity, correctness, accuracy) | Tests along the way <sup>27</sup> : | %             | 75% (minimum 5)                |                    |
|                         |  | Homework:                           | %             |                                |                    |
|                         |  | Other activities <sup>28</sup> :    | %             |                                |                    |
|                         |  | Final evaluation:                   | 80 % (min. 5) |                                |                    |



|  |  |   |                 |  |
|--|--|---|-----------------|--|
| 11.4b Seminar  | <ul style="list-style-type: none"><li>● Frequency/relevance of interventions or responses</li></ul>  | Record of interventions, portfolio of works (reports, scientific syntheses)   | % (minimum 5)   |  |
| 11.4c Laboratory   | <ul style="list-style-type: none"><li>● Knowledge of the equipment, how to use specific tools; evaluation of tools or achievements, processing and interpretation of results</li></ul> | <ul style="list-style-type: none"><li>● Oral answer</li><li>● Written questionnaire</li><li>● Laboratory notebook, experimental papers, reports, etc.</li><li>● Practical demonstration</li></ul> | 25% (minimum 5) |  |
| 11.4d Project  | <ul style="list-style-type: none"><li>● The quality of the project carried out, the correctness of the project documentation, the justification of the chosen solutions</li></ul>      | <ul style="list-style-type: none"><li>● Self-assessment, presentation and/or support of the project</li><li>● Critical evaluation of a project</li></ul>  | % (minimum 5)   |  |
| 11.5 Minimum Performance Standard <sup>29</sup><br>Acquiring the basic notions of each chapter studied, mandatory passing the exams along the way and the laboratory exam. |  |   |                 |  |

**The subject sheet includes components adapted to people with SEN (people with disabilities and people with high potential), depending on their type and degree, at the level of all curricular elements (competences, objectives, contents, teaching methods, alternative assessment), in order to ensure fair opportunities in the academic preparation of all students, paying close attention to individual learning needs.**

Date of completion: |\_07\_| / |\_09\_| / |\_2024\_|

Date of approval in the Department: |\_17\_| / |\_09\_| / |\_2024\_|

|                            | Teaching degree, title, first name, last name | Signature |
|----------------------------|---|-----------|
| Discipline holder          | Ion Brînza PhD                                |           |
| Responsible Degree program | Assoc.Prof. Ana-Maria Benedek-Sîrbu PhD       |           |
| Department Director        | Lecturer Ioan Tăușan PHD                      |           |



<sup>1</sup> Bachelor's/Master's degree

<sup>2</sup> 1-4 for bachelor's degree, 1-2 for master's degree

<sup>3</sup> 1-8 for bachelor's degree, 1-3 for master's degree

<sup>4</sup> Exam, colloquium or VP A/R – from the curriculum

<sup>5</sup> Discipline regime: O=Compulsory discipline; A=Optional subject; U=Optional

<sup>6</sup> Training category: S = Specialty; F=Fundamental; C=Complementary; I=Fully assisted; P=Partially assisted; N=Unassisted

<sup>7</sup> It is equal to 14 weeks x the number of hours in point 3.1 (similar for 3.2.a.b.c.)

<sup>8</sup> The lines below refer to individual study; the total is completed in point 3.37.

<sup>9</sup> Between 7 and 14 hours

<sup>10</sup> Between 2 and 6 hours

<sup>11</sup> The sum of the values on the previous lines, which refer to the individual study.

<sup>12</sup> 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 allocated to the discipline (point 3.7) x the number of hours per credit (3.6.)

<sup>13</sup> The credit number is calculated according to the following formula and rounded to whole neighboring values (either by decreasing or increasing

$$\text{No.credits} = \text{NOCpSpD} \times \text{CC} + \text{NOApSpD} \times \text{CATOCpSdP} \times \text{CC} + \text{TOApSdP} \times \text{CA} \times 30 \text{ credits}$$

Where:

- NOCpSpD = Number of hours of course/week/discipline for which credits are calculated
- NOApSpD = Number of Application Hours (Week/Lab/Pro.) /week/discipline for which credits are calculated
- TOCpSdP = Total number of course hours/week in the plan
- TOApSdP = Total number of application hours (week/lab/pro.) /week of plan
- CC/CA = 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                 |

<sup>14</sup> It mentions the subjects that must be previously passed or equivalent

<sup>15</sup> Whiteboard, video projector, flipchart, specific teaching materials, online platforms, etc.

<sup>16</sup> Computer technology, software packages, experimental stands, online platforms, etc.

<sup>17</sup> Competencies in the Grids related to the description of the study program, adapted to the specificity of the discipline

<sup>18</sup> From the curriculum

<sup>19</sup> The credits allocated to the discipline are distributed by professional and transversal competences depending on the specificity of the discipline

<sup>20</sup> Chapter and paragraph titles

<sup>21</sup> Exposition, lecture, presentation of the studied issues on the board, use of the video projector, discussions with the students (for each chapter, if applicable)

<sup>22</sup> Discussions, debates, presentation and/or analysis of papers, resolution of exercises and problems

<sup>23</sup> Practical demonstration, exercise, experiment

<sup>24</sup> Case study, demonstration, exercise, error analysis, etc.

<sup>25</sup> The connection with other disciplines, the usefulness of the discipline on the labor market

<sup>26</sup> CPE – conditions participation in the exam; nCPE – does not condition participation in the exam; CEF - conditions the final evaluation; N/A – not applicable

<sup>27</sup> The number of tests and the weeks in which they will be taken will be specified.

<sup>28</sup> Scientific circles, professional competitions, etc.

<sup>29</sup> The minimum performance standard from the competence grid of the study program is customized to the specificity of the discipline, if applicable.