

Delete the text marked in red when filling out the form.

For the text marked in blue, please select the relevant option according to the curriculum.

## COURSE DESCRIPTION

### *Neurophysiology*

Academic year 2026-2027

#### 1. Programme-related data

|                                       |                                      |
|---------------------------------------|--------------------------------------|
| 1.1. Higher Education Institution     | Babeş-Bolyai University, Cluj Napoca |
| 1.2. Faculty                          | Faculty of Biology and Geology       |
| 1.3. Department                       | Hungarian Biology and Ecology        |
| 1.4. Field                            | Biology                              |
| 1.5. Level of study                   | MSc                                  |
| 1.6. Degree programme / Qualification | Medical biology/biologist            |
| 1.7. Form of education                | Full time                            |

#### 2. Course-related data

|                          |                                       |               |   |                         |              |
|--------------------------|---------------------------------------|---------------|---|-------------------------|--------------|
| 2.1. Course title        | <b>Neurophysiology</b>                |               |   | Course code             |              |
| 2.2. Course coordinator  | Dr. Magor L. Lőrincz, Associate prof. |               |   |                         |              |
| 2.3. Seminar coordinator | Dr. Magor L. Lőrincz, Associate prof. |               |   |                         |              |
| 2.4. Year of study       | I                                     | 2.5. Semester | 2 | 2.6. Type of assessment | Exam         |
| 2.7. Course status       | Compulsory                            |               |   | 2.8. Course type        | Core subject |

#### 3. Total estimated time (hours per semester of teaching activities)

|   |     |                       |    |                                   |              |
|---|-----|-----------------------|----|-----------------------------------|--------------|
| 3.1. Number of hours per week   | 4   | of which: 3.2. course | 2  | 3.3. seminar/ laboratory/ project | 2            |
| 3.4. Total of hours in the curriculum   | 154 | of which: 3.5. course | 28 | 3.6. seminar/ laboratory          | 28           |
| <b>Time allocation for individual study (IS) and self-taught activities (ST)</b>  |     |                       |    |                                   | <b>hours</b> |
| Learning from textbooks, course materials, bibliography, and notes (IS)   |     |                       |    |                                   | 42           |
| Additional research in the library, on subject-specific electronic platforms, and on-site   |     |                       |    |                                   | 30           |
| Preparing seminars/ laboratories/ projects, assignments, reports, portfolios, and essays (greater than or equal to the total number of hours specified in the course calendar for evaluation tasks) |     |                       |    |                                   | 20           |
| Tutoring (professional guidance)  |     |                       |    |                                   | 0            |
| Examinations  |     |                       |    |                                   | 6            |
| Other activities [i.e.: two-way communication with the course coordinator/tutor]  |     |                       |    |                                   | 0            |
| <b>3.7. Total hours of individual study (IS) and self-taught activities (ST)</b>  |     |                       |    | <b>98</b>                         |              |
| <b>3.8. Total hours per semester</b>  |     |                       |    | <b>154</b>                        |              |
| <b>3.9. Number of credits</b>   |     |                       |    | <b>6</b>                          |              |

#### 4. Prerequisites (where applicable)

|                         |  |
|-------------------------|--|
| 4.1. curriculum-related |  |
| 4.2. skills-related     |  |

#### 5. Specific conditions (where applicable)

|                                 |   |
|---------------------------------|---|
| 5.1. course-related             | Lecture hall equipped with a laptop, projector, and appropriate software (PowerPoint, Word, multimedia programs, Internet access) |
| 5.2. seminar/laboratory-related | Properly equipped laboratory: general laboratory equipment, centrifuges, thermostats, an electrophoresis apparatus, a             |

|  |   |
|--|---|
|  | spectrophotometer, and a PCR machine. These instruments are provided by the Faculty of Biology and Geology. |
|--|---|

**6.1. Competencies resulting from the completion of the degree programme (as referred to in the curriculum)**

The professional and/or transversal skills targeted by the subject for which the course description is prepared will be copied from the curriculum of the degree programme. For each competency, the complete entry, including the competency code, will be copied with the exact wording that appears in the curriculum, without any changes. If no competency is copied from either of the two categories, the row corresponding to that category is deleted from the table.

| <b>Professional competencies</b> |   |
|----------------------------------|---|
| Competency code                  | Competency  |
| PC1                              | Ability to critically analyze scientific data, evaluate modern methods and technologies;        |
| PC4                              | ...   |
| PC5                              | ...   |
| <b>Transversal competencies</b>  |   |
| Competency code                  | Competency  |
| TC2                              | Ability to collaborate within a multidisciplinary team to improve workflow and service quality; |
| TC3                              | ...   |

**6.2. Learning outcomes relevant to the degree programme (as referred to in the curriculum)** The learning outcomes relevant for the degree programme and targeted by the subject for which the course description is prepared will be listed. The entries, copied without any changes from the Curriculum by subject type (Core Subject/Specialisation Subject/Complementary Subject), are listed under the corresponding competency.

| <b>Learning outcomes targeted by the subject</b> |                             |                          |
|--|-----------------------------|--------------------------|
| Competency code                                  | Knowledge and comprehension | Specific academic skills |
| PC1  | 1.                          | 1.                       |
| PC4  | 2.                          | 2.                       |
| PC5  | 3.                          | 3.                       |
| TC2  | ...                         | ...                      |
| TC3  | ...                         | ...                      |

**7. Subject-specific learning outcomes (referred to by each subject coordinator across the range of competencies and learning outcomes at the level of the degree programme)**

| <b>Knowledge and comprehension</b> |
|------------------------------------|
| 1. ...                             |
| 2. ...                             |
| 3. ...                             |
| 4. ...                             |
| <b>Specific academic skills</b>    |
| 1. ...                             |
| 2. ...                             |
| 3. ...                             |

## 8. Contents




















| <b>8.1. Course</b>  | <b>Teaching and learning methods</b>                   | <b>Remarks</b> For example, organisational aspects, recommendations for students, specific aspects relating to the course/seminar, such as inviting experts in the field, etc. |
|---|--|--|
| Introduction: the structure of the nervous system.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Methods for studying the nervous system.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| The resting membrane potential.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| The action potential.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 1: the neuromuscular synapse.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 2: excitatory and inhibitory synapses.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 3: presynaptic elements.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 4: postsynaptic elements.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 5: synaptic plasticity.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Synaptic neurotransmission 6: neural networks.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Neuromodulation.  | Lecture, discussion, debate, problem-based exploration | 2h   |
| Cortical functions 1.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| Cortical functions 2.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| The thalamocortical system.   | Lecture, discussion, debate, problem-based exploration | 2h   |
| Bibliography: <a href="#">Larry R. Squire</a> , <a href="#">Darwin Berg</a> : Fundamental Neuroscience, Third Edition, Academic Press, 2008 |  |  |
|   |  |  |
| <b>8.2. Seminar/ laboratory</b>   | <b>Teaching and learning methods</b>                   | <b>Remarks</b>   |
| Introduction: the structure of the nervous system.  | Debate, presentation, problem-based exploration        | 2h   |
| Methods for studying the nervous system.  | Debate, presentation, problem-based exploration        | 2h   |
| The resting membrane potential.   | Debate, presentation, problem-based exploration        | 2h   |
| The action potential.   | Debate, presentation, problem-based exploration        | 2h   |

|   |   |    |
|---|---|----|
| Synaptic neurotransmission 1: the neuromuscular synapse.  | Debate, presentation, problem-based exploration | 2h |
| Synaptic neurotransmission 2: excitatory and inhibitory synapses.   | Debate, presentation, problem-based exploration | 2h |
| Synaptic neurotransmission 3: presynaptic elements.   | Debate, presentation, problem-based exploration | 2h |
| Synaptic neurotransmission 4: postsynaptic elements.  | Debate, presentation, problem-based exploration | 2h |
| Synaptic neurotransmission 5: synaptic plasticity.  | Debate, presentation, problem-based exploration | 2h |
| Synaptic neurotransmission 6: neural networks.  | Debate, presentation, problem-based exploration | 2h |
| Neuromodulation.  | Debate, presentation, problem-based exploration | 2h |
| Cortical functions 1.   | Debate, presentation, problem-based exploration | 2h |
| Cortical functions 2.   | Debate, presentation, problem-based exploration | 2h |
| The thalamocortical system.   | Debate, presentation, problem-based exploration | 2h |
| Bibliography: Fonyó Attila: Orvosi élektan, <a href="#">Larry R. Squire</a> , <a href="#">Darwin Berg</a> : Fundamental Neuroscience, Third Edition, Academic Press, 2008 |   |    |
|   |   |    |

## 9. Evaluation

| Type of activity                 | 9.1 Evaluation criteria<br>The evaluation criteria must directly reflect the learning outcomes targeted at the level of the degree programme respectively at the level of the subject. More specifically, the learning outcomes set out in the expected learning outcomes are assessed. | 9.2 Evaluation methods<br>Both final evaluation methods and ongoing evaluation strategies should be established. | 9.3 Percentage in the final grade |
|----------------------------------|---|--|-----------------------------------|
| 9.4. Course                      |   |  |                                   |
| 9.5. Seminar/ laboratory         |   |  |                                   |
| 9.6 Minimum standard for passing |   |  |                                   |
| ...                              |   |  |                                   |

**10. SDG labels (Sustainable Development Goals)** Select a single label which, according to the *Implementation of SDG labels in the academic process*, best matches the subject. If the subject addresses sustainable development in a generic manner (i.e. by presenting/introducing the general framework of sustainable development, etc.), then the Sustainable Development generic label may be applied. If none of the labels describe the subject, select the last option: "No label applies."


|   |   |   |  |  |   |   |  |   |
|---|---|---|--|--|---|---|--|---|
|                                  |   |  Sustainable Development Generic Label         |  |  |   |   |  |   |
| <b>1</b> FĂRĂ SĂRĂCIE<br>        | <b>2</b> FOAMETE 'ZERO'<br>                | <b>3</b> SĂNĂTATE ȘI BUNĂSTARE<br>             | <b>4</b> EDUCATIE DE CALITATE<br> | <b>5</b> EGALITATE DE GEN<br> | <b>6</b> APĂ CURATĂ ȘI SĂNĂTATE<br> | <b>7</b> ENERGIE CURATĂ ȘI LA PREȚURI ACCESIBILE<br> | <b>8</b> MUNCĂ DECENTĂ ȘI CREȘTERE ECONOMICĂ<br>          | <b>9</b> INDUSTRIE, INOVAȚIE ȘI INFRASTRUCTURĂ<br> |
| <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>  |
| <b>10</b> INEGALITĂȚI REDUSE<br> | <b>11</b> ORAȘE ȘI COMUNITĂȚI DURABILE<br> | <b>12</b> CONSUM ȘI PRODUCȚIE RESPONSABILE<br> | <b>13</b> ACȚIUNE CLIMATICĂ<br>   | <b>14</b> VIAȚĂ ACVATICĂ<br>  | <b>15</b> VIAȚĂ TERESTRĂ<br>        | <b>16</b> PACE, JUSTIȚIE ȘI INSTITUȚII EFICIENTE<br> | <b>17</b> PARTENERIATE PENTRU REALIZAREA OBIECTIVELOR<br> | No label applies  |
| <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | <input type="checkbox"/>   | <input type="checkbox"/>  | <input type="checkbox"/>  | <input type="checkbox"/>   | X   |

Date of entry:  
4/28/2026

Signature of course coordinator



Signature of seminar coordinator



Date of approval in the department:  
...

Signature of the head of department

.....