



## Teaching Guide

| Teaching Guide           |                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         |           |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------------|-----------|
| Identifying Data         |                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         | 2020/21   |
| Subject (*)              | Basis of Neuroscience and Neurological Rehabilitation                                                                                                                                                                                                                                                                                                                                                                     |        | Code                    | 651516008 |
| Study programme          | Mestrado Universitario en Discapacidade e Dependencia (plan 2015)                                                                                                                                                                                                                                                                                                                                                         |        |                         |           |
| Descriptors              |                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         |           |
| Cycle                    | Period                                                                                                                                                                                                                                                                                                                                                                                                                    | Year   | Type                    | Credits   |
| Official Master's Degree | 2nd four-month period                                                                                                                                                                                                                                                                                                                                                                                                     | First  | Optional                | 6         |
| Language                 | SpanishGalician                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         |           |
| Teaching method          | Hybrid                                                                                                                                                                                                                                                                                                                                                                                                                    |        |                         |           |
| Prerequisites            |                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         |           |
| Department               | Fisioterapia, Medicina e Ciencias Biomédicas                                                                                                                                                                                                                                                                                                                                                                              |        |                         |           |
| Coordinador              | Viñas Diz, Susana                                                                                                                                                                                                                                                                                                                                                                                                         | E-mail | susana.vinas.diz@udc.es |           |
| Lecturers                | Robles García, Verónica                                                                                                                                                                                                                                                                                                                                                                                                   | E-mail | veronica.robles@udc.es  |           |
|                          | Viñas Diz, Susana                                                                                                                                                                                                                                                                                                                                                                                                         |        | susana.vinas.diz@udc.es |           |
|                          | Vivas Costa, Jamile                                                                                                                                                                                                                                                                                                                                                                                                       |        | j.vivas@udc.es          |           |
| Web                      |                                                                                                                                                                                                                                                                                                                                                                                                                           |        |                         |           |
| General description      | This course offers knowledge and principles of research in neuroscience and clinical practice in neurorehabilitation, with the aim of providing fundamentals of neurological pathology and enabling the student to critically integrate the different situations in the field of disability and dependency. Finally, this subject will qualify students to design research projects related to neurological dysfunctions. |        |                         |           |
| Contingency plan         | 1. Modifications to the contents<br><br>2. Methodologies<br>*Teaching methodologies that are maintained<br><br>*Teaching methodologies that are modified<br><br>3. Mechanisms for personalized attention to students<br><br>4. Modifications in the evaluation<br><br>*Evaluation observations:<br><br>5. Modifications to the bibliography or webgraphy                                                                  |        |                         |           |

## Study programme competences

| Code | Study programme competences                                                                                                                                                                                                                    |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A12  | CERF7. Ser capaz de integrar coñecementos avanzados no ámbito dos problemas neurolóxicos na persoa con discapacidade                                                                                                                           |
| A13  | CERF8. Capacidade para deseñar e executar proxectos de investigación nas disfuncións neurolóxicas                                                                                                                                              |
| B2   | CB7. Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en ámbitos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo |
| B5   | CB10. Que os estudantes posúan as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en boa medida autodirixido ou autónomo.                                                                          |
| B7   | CG2 Identificar, avaliar e resolver os problemas derivados da presenza de discapacidade e dependencia                                                                                                                                          |
| B9   | CG4 Ser capaz de intervir na problemática derivada da discapacidade e da dependencia                                                                                                                                                           |
| B10  | CG5 Capacidade para integrar coñecementos científicos de carácter avanzado ligados ao ámbito da discapacidade e a dependencia                                                                                                                  |
| C6   | CT6. Valorar críticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas aos que deben enfrontarse                                                                                                          |
| C7   | CT7. Ser capaz de valorar a importancia que ten a investigación, a innovación e o desenvolvemento tecnolóxico no avance socioeconómico e cultural da sociedade?                                                                                |



| Learning outcomes                                                                                                                                 |                             |                                  |            |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------|------------|
| Learning outcomes                                                                                                                                 | Study programme competences |                                  |            |
| To know the general pathology of brain and spinal neurological injury.                                                                            | AR12                        | BR7<br>BR9<br>BR10               |            |
| To be able to identify the characteristics of normal sensory, motor, and cognitive development during childhood.                                  | AR12                        | BR2<br>BR5<br>BR7<br>BR9<br>BR10 |            |
| To analyse the neurological foundations of disability and know the therapeutic bases and the capacity for improvement in neurological pathology.  |                             | BR2<br>BR5<br>BR7<br>BR9<br>BR10 | CR6        |
| To integrate motor control and motor learning theories.                                                                                           | AR12                        | BR2<br>BR5<br>BR7<br>BR9<br>BR10 | CR6        |
| To know the physiological basis of neuronal plasticity and regeneration.                                                                          | AR12                        | BR2<br>BR5<br>BR10               |            |
| To deep into neuronal plasticity as the basis of neurological physiotherapy.                                                                      | AR12                        | BR2<br>BR5<br>BR7<br>BR9<br>BR10 | CR6<br>CR7 |
| To know the different imaging techniques for the study of the nervous system.                                                                     | AR13                        | BR2<br>BR5<br>BR10               | CR7        |
| To know different techniques of clinical neurophysiology for the study of the nervous system.                                                     | AR12<br>AR13                | BR2<br>BR10                      | CR6<br>CR7 |
| To know the models and techniques of basic research in neuroscience, as well as concepts and principles of research about neurological pathology. | AR12<br>AR13                | BR2<br>BR10                      | CR6<br>CR7 |
| To understand the importance of research in functional recovery in neurological rehabilitation.                                                   | AR12                        |                                  | CR7        |
| To acquire skills to identify and evaluate the different scenarios of research in neurological pathology.                                         | AR12<br>AR13                | BR2<br>BR5<br>BR7<br>BR10        | CR6<br>CR7 |

| Contents |           |
|----------|-----------|
| Topic    | Sub-topic |



|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Neurological foundations of disability.                                         | <ul style="list-style-type: none"> <li>- Embryology, development and maturation of the nervous system.</li> <li>-Anatomy and physiology of motor control and postural control systems.</li> <li>-Anatomy and physiology of the sensory system.</li> <li>-Identification of the neurological pathologies that generate disability and their characteristics.</li> <li>-General pathology of brain and spinal neurological injury.</li> <li>-The pathophysiology of the main semiological findings in neurological patients.</li> </ul> |
| Therapeutic basis and capacity for improvement in neurological pathology.       | <ul style="list-style-type: none"> <li>-Aims of therapies which are used in the approach of neurological pathologies.</li> <li>-Functional capacity concept and disability according to the CIF (WHO, 2001).</li> <li>- Theoretical models on which physical therapy modalities are based to address neurological pathologies.</li> <li>-Motor control and motor learning theories, physiology of disability and neuronal regeneration. Mirror neurons physiology.</li> </ul>                                                         |
| Basic research in neuroscience. Present and future of research in neuroscience. | <ul style="list-style-type: none"> <li>-Experimental models and laboratory techniques.</li> <li>-Radiology and imaging techniques for the study of the nervous system.</li> <li>-Clinical Neurophysiology.</li> <li>-Kinematic and functional evaluation of neurological pathology.</li> </ul>                                                                                                                                                                                                                                        |

| Planning                                                                                                                        |                                  |                      |                               |             |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------|-------------------------------|-------------|
| Methodologies / tests                                                                                                           | Competencies                     | Ordinary class hours | Student?s personal work hours | Total hours |
| Guest lecture / keynote speech                                                                                                  | B7 B10 C6 C7                     | 21                   | 4                             | 25          |
| Critical bibliographical                                                                                                        | A12 B5 B10 C6 C7                 | 0                    | 10                            | 10          |
| ICT practicals                                                                                                                  | A12 A13 B5 B7 B9 C6              | 3                    | 0                             | 3           |
| Supervised projects                                                                                                             | A12 A13 B2 B5 B7 B9<br>B10 C6 C7 | 3                    | 50                            | 53          |
| Seminar                                                                                                                         | A12 B10 C7 C6                    | 6                    | 10                            | 16          |
| Directed discussion                                                                                                             | A13 A12 B2 B7 B9 C6<br>C7        | 3                    | 10                            | 13          |
| Case study                                                                                                                      | A12 B2 B7 B9 B10                 | 3                    | 20                            | 23          |
| Mixed objective/subjective test                                                                                                 | A12 A13 B2 B7 B9<br>B10 C6 C7    | 1                    | 0                             | 1           |
| Personalized attention                                                                                                          |                                  | 6                    | 0                             | 6           |
| (*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students. |                                  |                      |                               |             |

| Methodologies                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Methodologies                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Guest lecture / keynote speech | <p>Exposición oral complementada co uso de medios audiovisuais e a introdución dalgunhas preguntas dirixidas aos estudantes, coa finalidade de transmitir coñecementos e facilitar a aprendizaxe.</p> <p>A clase maxistral é tamén coñecida como ?conferencia?, ?método expositivo? ou ?lección maxistral?. Esta última modalidade adóitase reservar a un tipo especial de lección impartida por un profesor en ocasións especiais, cun contido que supón unha elaboración orixinal e baseada no uso case exclusivo da palabra como vía de transmisión da información á audiencia.</p> |
| Critical bibliographical       | Son un conxunto de textos e documentación escrita que se recolleron e editaron como fonte de afondamento nos contidos traballados                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ICT practicals                 | Metodoloxía que permite que os estudantes aprendan efectivamente a través da realización de actividades de carácter práctico, tales como demostracións, exercicios, experimentos e investigacións.                                                                                                                                                                                                                                                                                                                                                                                     |



|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Supervised projects             | Metodoloxía deseñada para promover a aprendizaxe autónoma dos estudantes, baixo a tutela do profesor e en escenarios variados (académicos e profesionais). Está referida prioritariamente ao aprendizaxe do ?como facer as cousas?. Constitúe unha opción baseada na asunción polos estudantes da responsabilidade pola súa propia aprendizaxe.<br>Este sistema de ensino baséase en dous elementos básicos: a aprendizaxe independente dos estudantes e o seguimento desa aprendizaxe polo profesor-titor.                                                                                              |
| Seminar                         | Técnica de traballo en grupo que ten como finalidade o estudo dun tema caracterizado pola discusión, a participación e a elaboración de documentos.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Directed discussion             | Técnica de dinámica de grupos na que os membros dun grupo discuten de forma libre, informal e espontánea sobre un tema, aínda que poden estar coordinados por un moderador                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Case study                      | Metodoloxía na que un estudante se enfronta ante unha descrición dunha situación específica que suscita un problema que ten que ser comprendido, valorado e resolto por un grupo de persoas a través dun proceso de discusión. O alumno situáse ante un problema en concreto (caso), que describe unha situación real da vida profesional no ámbito da investigación clínica e debe de ser capaz de analizar unha serie de feitos, referentes a un campo particular do coñecemento o dunha acción, para chegar a unha decisión razoada a través dun proceso de discusión en pequenos grupos de traballo. |
| Mixed objective/subjective test | Exame teórico que constará de preguntas tipo test e desenvolvemento                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

## Personalized attention

| Methodologies                                                                                                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Case study<br>Guest lecture /<br>keynote speech<br>Critical<br>bibliographical<br>Supervised projects<br>Seminar | In all methodologies described, the student will have access to personalized attention. In those methodologies oriented to the student to perform a more autonomous work, students will have specialized attention making use of face-to-face and / or virtual tutorials through moodle platform, and / or email.<br><br>Those students with part-time dedication, or academic exemption of attendance, will have the same personalized attention described above, and in addition they will have available a description of the material they need to read for the preparation / study of the subject. |

## Assessment

| Methodologies                         | Competencies                     | Description                                                                                                                                                                                                                                                                                                                                                 | Qualification |
|---------------------------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| Critical<br>bibliographical           | A12 B5 B10 C6 C7                 | Son un conxunto de textos e documentación escrita que se recolleron e editaron como fonte de afondamento nos contidos traballados                                                                                                                                                                                                                           | 10            |
| Supervised projects                   | A12 A13 B2 B5 B7 B9<br>B10 C6 C7 | Metodoloxía deseñada para promover a aprendizaxe autónoma dos estudantes, baixo a tutela do profesor. Os estudantes teñen que adquirir/asumir a responsabilidade da súa propia aprendizaxe, cun seguimento desta polo profesor.                                                                                                                             | 40            |
| Seminar                               | A12 B10 C7 C6                    | Técnica de traballo en grupo que ten como finalidade o estudo dun tema caracterizado pola discusión, a participación e a elaboración de documentos.                                                                                                                                                                                                         | 10            |
| Mixed<br>objective/subjective<br>test | A12 A13 B2 B7 B9<br>B10 C6 C7    | Proba que integra preguntas tipo de proba de ensaio e preguntas de tipo obxectivas. En relación coas preguntas de ensaio, recolle preguntas abertas de desenvolvemento. Ademais, en relación coas preguntas obxectivas, pode combinar preguntas de resposta múltiple, de ordenación, de resposta breve, de discriminación, de completar e/ou de asociación. | 40            |

## Assessment comments



The

assessment methodologies described above (bibliographic review, supervised essays, seminar, mixed tests) will be the same for the first and second opportunities, computing each one of them in the final grade of the subject, using the percentage rating already mentioned.

For those students with part-time

dedication or academic exemption of attendance, the same evaluation system will be used (both in terms of the methodologies used and methodologies computes in the final grade of the subject).

## Sources of information

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Basic</b>         | <ul style="list-style-type: none"> <li>- Haines, D. (2014). Principos de Neurociencia. Aplicaciones básicas y clínicas. Barcelona: Elsevier Saunders</li> <li>- Kandel,ER (2013). Principles of neural science.. New York: McGraw-Hill</li> <li>- Cano de la Cuerda, R; Collado Vázquez, S (2012). Neurorrehabilitación. Métodos específicos de valoración y tratamiento. Madrid: Panamericana</li> <li>- García García, J.; Jiménez Ponce, F; Arnaud Viñas,M; Ramírez Tapia, Y; Lino Pérez, L. (). Introducción a la metodología de investigación en Ciencias de la Salud. México: McGraw-Hill Interamericana editores</li> <li>- Cudeiro Mazaira, J; Arias Rodríguez, P; Robles García, V; Corral Bergantiños, Y (2015). Fundamentos de neurociencia y neurorrehabilitación. Madrid: Síntesis</li> <li>- Hulley, S.; Cummings, S.; Browner, W.; Grady, B. (2013). Diseño de investigaciones clínicas. Philadelphia: Lippincott Williams &amp; Wilkins</li> <li>- Arias Rodríguez, P; Cudeiro Mazaira, J; Mariño Alfonso, X; Molero Ruiz, J; Rivadulla Fernández, C; R (2014). Reeducción funcional en la enfermedad de Parkinson. Barcelona: Elsevier España</li> <li>- Stokes, M; Stacks, E. (2013). Fisioterapia en la rehabilitación neurológica. Barcelona: Elsevier</li> </ul> |
| <b>Complementary</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

## Recommendations

### Subjects that it is recommended to have taken before

### Subjects that are recommended to be taken simultaneously

### Subjects that continue the syllabus

## Other comments

In order to help achieve an immediate sustainable environment and meet the Green Campus strategic objectives from the Faculty of Physiotherapy, the documentary work carried out in this area may be requested in paper, virtual format or computer support. If done on paper, the following general recommendations will be followed as far as possible: - Plastics will not be used.- Double-sided prints will be preferred.- Recycled paper will be chosen.- Drafting will be avoided.

(\*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.