



Teaching Guide

Identifying Data					2019/20
Subject (*)	Learning and Motor Control		Code	620G01012	
Study programme	Grao en Ciencias da Actividade Física e do Deporte				
Descriptors					
Cycle	Period	Year	Type	Credits	
Graduate	2nd four-month period	Second	Basic training	6	
Language	SpanishEnglish				
Teaching method	Face-to-face				
Prerequisites					
Department	Educación Física e Deportiva				
Coordinador	Sanchez Molina, Jose Andres	E-mail	jose.andres.sanchez.molina@udc.es		
Lecturers	Morenilla Burlo, Luis Sanchez Molina, Jose Andres Sevilla Sánchez, Marta	E-mail	luis.morenilla@udc.es jose.andres.sanchez.molina@udc.es marta.sevilla@udc.es		
Web	www.motorcontrolgroup.com				
General description	<p>The motor control is a scientific discipline that tries to answer to the basic question of how the human being controls the movement? This discipline is not more than an attempt to integrate a lot of other sciences that ask the same, but that historically have not related between himself. The psychology, the neurofisiología or the neurology are examples of sciences that have contributed a lot of knowledge on the operation of the nervous system and his paper in the human movement but that have kept, until does not do a lot, an isolated speech join them of the others. I do not want to say with this that the control engine was the %or201Cdisciplina%or201D that will resolve finally all our doubts, but it reflects the importance to tackle the human movement with a multidisciplinary approach or rather interdisciplinar, since it is the only way to arrive to understand how the human being controls his gifted movements of intention.</p>				

Study programme competences / results

Code	Study programme competences / results
A14	Deseñar, planificar, avaliar técnico-cientificamente e desenvolver programas de exercicios orientados á prevención, a reeducación, a recuperación e readaptación funcional nos diferentes ámbitos de intervención: educativo, deportivo e de calidade de vida, considerando, cando fose necesario as diferenzas por idade, xénero, ou discapacidade.
A22	Comprender os fundamentos neurofisiolóxicos e neuropsicolóxicos subxacentes ao control do movemento e, de ser o caso, ás diferenzas por xénero. Ser capaz de realizar a aplicación avanzada do control motor na actividade física e o deporte.
A27	Aplicar os principios cinesiolóxicos, fisiolóxicos, biomecánicos, comportamentais e sociais nos contextos educativo, recreativo, da actividade física e saúde e do adestramento deportivo, recoñecendo as diferenzas biolóxicas entre homes e mulleres e a influencia da cultura de xénero nos hábitos de vida dos participantes.
A35	Coñecer e saber aplicar o método científico nos diferentes ámbitos da actividade física e o deporte, así como saber deseñar e executar as técnicas de investigación precisas, e a elección e aplicación dos estatísticos adecuados.
B1	Coñecer e posuír a metodoloxía e estratexia necesaria para a aprendizaxe nas ciencias da actividade física e do deporte.
B2	Resolver problemas de forma eficaz e eficiente no ámbito das ciencias da actividade física e do deporte.
B3	Traballar nos diferentes contextos da actividade física e o deporte, de forma autónoma e con iniciativa, aplicando o pensamento crítico, lóxico e creativo.
B4	Trabajar de forma colaboradora, desenvolvendo habilidades, de liderado, relación interpersoal e traballo en equipo.
B5	Comportarse con ética e responsabilidade social como cidadán.
B7	Xestionar a información.
B9	Comprender a literatura científica do ámbito da actividade física e o deporte en lingua inglesa e en outras linguas de presenza significativa no ámbito científico.
B10	Saber aplicar as tecnoloxías da información e comunicación (TIC) ao ámbito das Ciencias da Actividade Física e do Deporte.
B11	Desenvolver competencias para a adaptación a novas situacións e resolución de problemas, e para a aprendizaxe autónoma.
B12	Coñecer os principios éticos necesarios para o correcto exercicio profesional e actuar de acordo con eles.



B13	Coñecer e aplicar metodoloxías de investigación que faciliten a análise, a reflexión e cambio da súa práctica profesional, posibilitando a súa formación permanente.
B16	Dominar habilidades de comunicación verbal e non verbal necesarias no contexto da actividade física e o deporte.
B20	Coñecer, reflexionar e adquirir hábitos e destrezas para a aprendizaxe autónoma e o traballo en equipo a partir das prácticas externas en algún dos principais ámbitos de integración laboral, en relación ás competencias adquiridas no grao que se verán reflectidas no traballo fin de grao.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
C2	Dominar a expresión e a comprensión de forma oral e escrita dun idioma estranxeiro.
C3	Utilizar as ferramentas básicas das tecnoloxías da información e as comunicacións (TIC) necesarias para o exercicio da súa profesión e para a aprendizaxe ao longo da súa vida.
C4	Desenvolverse para o exercicio dunha cidadanía aberta, culta, crítica, comprometida, democrática e solidaria, capaz de analizar a realidade, diagnosticar problemas, formular e implantar solucións baseadas no coñecemento e orientadas ao ben común.
C5	Entender a importancia da cultura emprendedora e coñecer os medios ao alcance das persoas emprendedoras.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
C7	Asumir como profesional e cidadán a importancia da aprendizaxe ao longo da vida.
C8	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 / results		
Know and comprise the foundations neurofisiolóxicos and neuropsicolóxicos underlying to the control of the human movement and his development	A22 A27	B2 B5 B10 B13	C1 C2 C6
Be able to realise the application advanced of the control and learning engine in the fields of performance of the physical activity and of the sport, and , in his case, considering the differences by gender	A14 A27 A35	B1 B2 B3 B4 B5 B7 B9 B10 B11 B12 B13 B16 B20	C3 C4 C5 C6 C7 C8

Contents	
Topic	Sub-topic
Thematic block 1. Introduction to learning and motor control	Topic 1.1 Conceptualization and History of learning and motor control Topic 1.2 Motor behavior and measurement Topic 1.3 Model of information processing and decision making
Thematic block 2. Neurophysiological bases of motor control	Topic 2.1 Collection of sensory information for movement control Topic 2.2 Spinal control of movement Topic 2.3 Cortical control of movement Topic 2.4 Intervention of subcortical areas: Basal Ganglia Topic 2.5 Intervention of subcortical areas: Cerebellum



Thematic block 3. Control of human movement	<p>Topic 3.1 Sensory contribution for the execution of the movement</p> <p>Topic 3.2 Movement production and motor program</p> <p>Topic 3.3 Principles of motor control and movement accuracy</p> <p>Topic 3.4 Individual differences and motor skills</p>
Thematic block 4. Principles of motor learning	<p>Topic 4.1 Motor learning</p> <p>Topic 4.2 Implementation of motor learning</p> <p>Topic 4.3 Structuring of learning</p> <p>Topic 4.4 Feedback during learning</p>

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student's personal work hours	Total hours
Introductory activities	B7 C6	1	0	1
Laboratory practice	A22 A35 B4 B12 B20 C3 C6 C8	16	12	28
Guest lecture / keynote speech	A22 A35 B7 C4 C5 C7	29	58	87
ICT practicals	A22 B7 B9 B13 C3	4	12	16
Mixed objective/subjective test	A14 A27 B1 B2 B9 B10 B11 B13 B16 C2 C1	2	0	2
Clinical test:	B2 B3 B5 B7 B13 C8	0	8	8
Events academic / information	B3 B5 B7 C8 C7	0	7	7
Personalized attention		1	0	1

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.

Methodologies	
Methodologies	Description
Introductory activities	<p>A complete explanation of the aspects addressed in the teaching guide will be explained the first day of class in order that students know the skills that are intended to acquire.</p> <p>In the same way prior to the completion of any of the proposed works and activities, the necessary information will be provided and the students will be organized for their optimal development.</p>
Laboratory practice	Laboratory practices will be carried out on the theoretical contents taught in the subject. In each practice the student will participate as an evaluator and as an experimental subject.
Guest lecture / keynote speech	The fundamental contents will be taught through a magisterial session, although will be demanded an active participation of the students, presenting problems and questions to solve.
ICT practicals	An application such as Kahoot or similar will be used, with the intention of encouraging students to be aware of the contents raised in previous sessions or even in the session itself. It will also serve to determine the participation of students. Students with lower scores may be responsible for preparing questionnaires to be presented in a next session where Kahoot is used.
Mixed objective/subjective test	A exam t that can integrate questions such as essay tests and question type of objective tests. As for essay questions, it gathers open questions of development. In addition, as objective questions, you can combine multiple-choice, ordering, brief response, discrimination, completion, and / or association questions.
Clinical test:	Participate as an experimental subject or as an assistant in studies developed in the "Group of learning and control of the human movement in physical activity and sport (ACoM)".
Events academic / information	Participate in scientific and / or informative events related to the contents of the subject.

Personalized attention	
Methodologies	Description



Laboratory practice Guest lecture / keynote speech	Queries or questions raised by students will be solved individually through previously agreed meetings. The tutoring schedules of the subject, programmed by the center, will make it possible to complete, in small groups, the tasks not developed in the laboratory sessions of the official schedule.
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Assessment			
Methodologies	Competencies / Results	Description	Qualification
Events academic / information	B3 B5 B7 C8 C7	The criterion of equivalence of 0.1 points of the final grade for each hour of activity up to a maximum of 0.75 points is established in this methodology. If the student does not participate in this methodology or the final score obtained in this section is lower than the mixed test score its percentage will be included in the percentage of the mixed test.	7.5
Mixed objective/subjective test	A14 A27 B1 B2 B9 B10 B11 B13 B16 C2 C1	Test done at the end of the subject, on scheduled exam date.	55
ICT practicals	A22 B7 B9 B13 C3	A series of controls related to both practices and theoretical contents, in order to motivate attendance, continuous study and the resolution of doubts, will be presented through TICs (Moodle, Kahoot, Symbaloo), during the course The data recorded in the practices will be include them in the platform / digital application established, obligatorily. This will allow the analysis of the data, generate new approaches and answer related questions.	30
Clinical test:	B2 B3 B5 B7 B13 C8	The criterion of equivalence of 0.1 points of the final grade for each hour of activity up to a maximum of 0.75 points is established in this methodology. If the student does not participate in this methodology or the final score obtained in this section is lower than the mixed test score its percentage will be included in the percentage of the mixed test.	7.5

Assessment comments
Regarding the performance of the mixed test: The result of the mixed test must be equal to or greater than 5.00 to perform the weighted average with the remaining elements of the evaluation. The score of each question will be made explicit on the exam sheet, in case the questions have a different value. The weighted average result of the different evaluation elements must be equal to or greater than 5.00 to overcome the subject. Both the mixed test and the practical tests through TICs will be given to the students in the language in which the subject is imparted (Spanish). Any student wishing to have the mixed test in another official language of the UDC must request it from the teacher at least one week in advance. Regarding the examination calls: each call consists of two opportunities (June and July); when in the same call a student has a grade of "not presented" on one occasion and "suspended" on the other, in his / her record it will be shown as "suspense". The student can choose to perform only the "clinical test" methodology or only the methodology "scientific and / or informative events" in which case you can get up to 1.5 points in any one. Maintenance of notes in the second opportunity of the call: the califications obtained in any of the evaluation sections achieved at the first opportunity of each call will be maintained if the student so wishes. Maintenance of notes in subsequent calls: the qualifications obtained in any of the evaluation sections obtained in previous examinations will be maintained, except in the case of a possible change of the teacher that imparts the subject; the criteria for extraordinary calls will be the same as those already established. Consideration in the case of partial registration: the evaluation will be carried out in the same way as for the rest of the students with full registration.

Sources of information



Basic	<ul style="list-style-type: none"> - Fernández del Olmo, M. Á. (2012). Neurofisiología aplicada a la actividad física. Madrid: Síntesis - Kandel, E.R., Schwartz, J.H. y Jessell, T.M. (2001). Principios de neurociencia (4ª ed.). Madrid: McGraw-Hill - Latash, Mark L. (1998). Neurophysiological basis of movement. Champaign, IL: Human Kinetics - Schmidt, R. A. y Lee, T. D. (2011). Motor control and learning: a behavioral emphasis (5ª ed). Champaign, IL: Human Kinetics - Schmidt, R. A. y Wrisberg, C. A. (2008). Motor learning and performance: A situation-based learning approach (4ª ed). Champaign, IL: Human Kinetics
Complementary	<ul style="list-style-type: none"> - Cardinali, Daniel P. (2007). Neurociencia aplicada: sus fundamentos. Madrid: Médica Panamericana - Felten, D., Shetty, A. y Netter F. (2010). Atlas de Neurociencia. Barcelona: Masson - Goldstein, E. Bruce (2006). Sensación y percepción. Madrid : Thomson-Paraninfo - Magill, R. y Anderson, D. (2017). Motor Learning and Control: Concepts and Applications. New York: McGraw-Hill Education - Martens, R. (2002). El entrenador de éxito. Barcelona: Paidotribo - Oña Sicilia, Antonio (1999). Control y aprendizaje motor. Madrid: Síntesis - Ponz Piedrafita, Francisco y Barber Cárcamo, A. María (1989). Neurofisiología. Madrid: Síntesis - Rothwell, J. C. (1994). Control of human voluntary movement (2ª ed). London: Chapman & Hall - Shumway-Cook, Anne y Woollacott, Marjorie H. (2007). Motor control: translating research into clinical practice. Philadelphia : Lippincott Williams & Wilkins

Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Anatomy and Kinetics of Human Movement/620G01002
 Psychology of Physical Activity and Sport/620G01011
 Physiology of Exercise I/620G01013

Subjects that continue the syllabus

Physical Activity and Sports Research/620G01021
 Technology in Physical Activity and Sport/620G01034

Other comments

(*)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.