Teaching Guide				
Identifying Data				2020/21
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	Hybrid			
Prerequisites				
Department	Educación Física e Deportiva			
Coordinador	Sanchez Molina, Jose Andres	E-mail	jose.andres.sanchez.molina@udc.es	
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Web	www.motorcontrolgroup.com			
General description	Motor control is a scientific discipline that attempts to answer the basic question of how humans control movement. This discipline is nothing more than an attempt to integrate many other sciences that ask the same question, but that historically have not been related to each other. Psychology, neurophysiology or neurology are examples of sciences that have contributed a great deal of knowledge about the functioning of the nervous system and its role in human movement but which have maintained, until not long ago, a discourse isolated from each other. This does not mean that motor control is the "discipline" that will ultimately resolve all our doubts, but rather that it reflects the importance of approaching human movement with a multidisciplinary or, rather, interdisciplinary approach, given that it is the only way to understand how human beings control their movements with intention.			

Contingency plan	1. Modifications to the contents - No changes will be made. 2. Methodologies *Teaching methodologies that are maintained: - Guest lecture/keynote speech - ICT practicals *Teaching methodologies that are modified: - Laboratory practices: - Raw records of practices from previous courses will be used for analysis, obtaining results and subsequent discussion and evaluation through questionnaires posed through ICT. - The number of practices in which the registration system is the interaction with the PEBL application will be increased. - Events academic/information - Clinical test. 3. Mechanisms for personalized attention to students: - Email: Daily. Used to make queries, request virtual meetings to resolve doubts and send notifications on the development of the subject. - Moodle: weekly, with scheduled activities and notices through "news". - MSTeams: 3 weekly sessions to advance in the theoretical content and activities to develop (explanation of practices, procedures, records, analysis and discussion of results). An additional session every two weeks as a mandatory tutoring established by the center, in the schedule of academic activity, to advance in the aspects of theoretical or practical nature that are required (students will be asked to establish the demand for the content of the tutoring). 4. Modifications in the evaluation - Mixed objetive/subjetive test: 25% (normal basic situation: 40%; it can reach 55% if the methodologies of: scientific and/or informative events and clinical tests are not carried out). - ICT Practicals: 75% (normal situation: 45%) *Evaluation observations: - It corresponds to those raised in the section "evaluation observations" of the guide. 5. Modifications to the bibliography or webgraphy - No changes will be made. By default, the necessary documents for the development of the subject (mainly, articles, manuals an tutorials) are already incorporated in Moodle.

Study programme competences	
Code	Study programme competences
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		
Know and comprise the foundations neurofisiológicos and neuropsicológicos 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 Topic 1.4. Conditions for the processing of information
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 Subcortical motion control: Basal Ganglia Topic 2.5 Subcortical motion control: Cerebellum
Thematic block 3. Control of human movement	Topic 3.1 Control systems for motion execution Topic 3.2 Movement production and motor program Topic 3.3 Principles of motor control and movement accuracy Topic 3.4 Individual differences and motor skills
Thematic block 4. Principles of motor learning	Topic 4.1 Motor learning Topic 4.2 Implementation of motor learning Topic 4.3 Structuring of learning Topic 4.4 Feedback during learning

Planning				
Methodologies / tests	**Competencies**	**Ordinary class hours**	**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 C1 C2	2	0	2
Clinical test:	B2 B3 B5 B7 B13 C8	0	8	8
Events academic / information	B3 B5 B7 C7 C8	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	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. 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.
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. During the present course the sessions will be developed in virtual mode and in a synchronous way.

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.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Events academic / information	B3 B5 B7 C7 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
Mixed objective/subjective test	A14 A27 B1 B2 B9 B10 B11 B13 B16 C1 C2	Test done at the end of the subject, on scheduled exam date.	40
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.	45
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 month 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	- 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	- 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
In order to improve our school's internal quality assurance system, it would be advisable for students to respond to the request made by the UDC, every four months, to participate in the evaluation process of the subjects they have studied". This request is called "AVALIA" and consists of answering the questionnaires that evaluate the teaching of the teachers in each subject.

(*)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.