



Teaching Guide

Teaching Guide				
Identifying Data				2023/24
Subject (*)	Biomechanics of the Lower Limb		Code	750G02111
Study programme	Grao en Podoloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	1st four-month period	Second	Obligatory	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Fisioterapia, Medicina e Ciencias Biomédicas			
Coordinador	Raposo Vidal, Isabel		E-mail	isabel.raposo.vidal@udc.es
Lecturers	Pose Gontad, Alba Raposo Vidal, Isabel		E-mail	alba.poseg@udc.es isabel.raposo.vidal@udc.es
Web	campusvirtual.udc.gal/			
General description	A materia de Biomechanica do Membro Inferior supón o coñecemento dos fundamentos da cinemática e cinética do membro inferior tanto analíticamente como na súa globalidade funcional. A través da biomecánica descriptiva e aplicada a sistemas de rexistro, o alumno desenvolverá por un lado a descrición do movemento en termos de desplazamento, recorridos angulares e factores estabilizadores do mesmo; así como as forzas responsables dos devanditos sistemas estáticos e/ou dinámicos.			

Study programme competences

Code	Study programme competences
A84	CE20 Coñecer os fundamentos da biomecánica e a cinesiología
A85	CE21 - Coñecer os instrumentos de análise biomecánico e a biomecánica da marcha humana e obter a capacidade de análise da marcha
A86	CE22 - Coñecer as alteracións estruturais do pé e o seu comportamento biomecánico e coñecer as alteracións posturais do aparello locomotor e a súa influencia sobre o pé e viceversa
B24	CB2 - Que os estudantes saiban aplicar os seus coñecementos ao seu traballo ou vocación dunha forma profesional e posúan as competencias que adoitan demostrarse por medio da elaboración e defensa de argumentos e a resolución de problemas dentro da súa área de estudo
B25	CB3 -- Que os estudantes teñan a capacidade de reunir e interpretar datos relevantes (normalmente dentro da súa área de estudo) para emitir xuízos que inclúan unha reflexión sobre temas relevantes de índole social, científica ou ética
B28	CG01 - Coñecer e aplicar os fundamentos teóricos e metodolóxicos da Podoloxía e Podiatría
B32	CG05 - Colaborar cos profesionais sanitarios especificamente formados na materia, na adaptación e uso de prótese e axudas técnicas necesarias, segundo as condicións físicas, psicolóxicas e sociais dos doentes
B39	CG12 -Capacidade para a cooperación, o traballo en equipo e a aprendizaxe colaborativo en contornas interdisciplinares
C9	CT01 - Expresarse correctamente, tanto de forma oral como escrita, nas linguas oficiais da comunidade autónoma
C11	CT03 - 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
C17	CT09 - Ter a capacidade de xestionar tempos e recursos: desenvolver plans, priorizar actividades, identificar as críticas, establecer prazos e cumprilos

Learning outcomes

Learning outcomes	Study programme competences		
Develop the biomechanical evaluation parameters of the lower extremity and design and execute an evaluation protocol.	A84	B24	C9
	A85	B25	C11
	A86	B28	C17
		B32	
		B39	



Know and define the fundamentals of the kinematics, statics and dynamics of the entire lower limb both analytically (joint levels) and in its functional globality through descriptive biomechanics and applied to registration systems.	A84 A85 A86	B24 B25 B28 B32 B39	C9 C11 C17
Know and define the morphostructural alterations of the foot.	A84 A85 A86	B28	
Know and manage biomechanical analysis instruments	A85 A86	B28 B39	C9 C11

Contents	
Topic	Sub-topic
I. METATATIC UNIT I. FUNDAMENTALS OF BIOMECHANICS AND KINESIOLOGY	1.1. Biomechanics and kinesiology. 1.2. Kinematic and kinetic parameters. 1.3. Tissue biomechanics. 1.3.1. Bone 1.3.2. Articular cartilage 1.3.3. ligaments and tendons 1.3.4. fascias
II. THEMATIC UNIT II. JOINT BIOMECHANICS, POSTURE AND GALING 2.1. biomechanics gives posture	2.2. biomechanics kicks off 23. Biomechanics of the pelvic belt 2.4. Biomechanics of the hip joint 2.5. biomechanics of the knee 2.6. Biomechanics of the tibiofibular and tibiofibular-talar joints 2.7. Biomechanics of the subtalar, intertarsal, tarso-metatarsal, metatarsophalangeal and interphalangeal joints.
III. THEMATIC UNIT III. BIOMECHANICAL ANALYSIS SYSTEMS	3.1. Kinematic and kinetic parameters 3.2. Study and visual analysis 3.3. Study and instrumental analysis 3.4. Quantitative analysis. 3.5. Qualitative analysis 3.6. scales 3.7. Measuring instruments and systems
IV. THEMATIC UNIT IV. MORPHOSTRUCTURAL AND POSTURAL ALTERATIONS	4.1. Morphostructural alterations of the tibio-fibular-talar and foot joints. 4.2. Morphostructural alterations of the hip and knee joints.

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Practical test:	A86 B24 B25 B28 C9 C17	1	16	17
Guest lecture / keynote speech	A84 A85 A86	21	0	21
Laboratory practice	B25 B28 C9 C11 C17	9	9	18
Seminar	A85 A86 B24 B39 C9	14	28	42
Mixed objective/subjective test	A84 A85 A86 B24 B25 B32 B39 C9 C11 C17	2	48	50
Personalized attention		2	0	2

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



Methodologies

Methodologies	Description
Practical test:	Proba que se realizará no laboratorio de prácticas e na que se buscará que o/a alumno/a desenvolva algunha técnica, método o procedemento que se tivese feito durante as clases prácticas.
Guest lecture / keynote speech	Clases expositivas para os grupos grandes de forma virtual. Expondranse contidos teóricos.
Laboratory practice	Prácticas no laboratorio de Biomecánica. Reprodúcense técnicas, métodos e procedementos de exploración biomecánica previamente explicados e representados pola profesora.
Seminar	Técnica de traballo que ten como finalidade o estudo intensivo dun tema e que dará como resultado elaboración de documentos con presentacións orais, cuestionarios e un portafolios. Serán individuais e en grupo.
Mixed objective/subjective test	Proba que integra preguntas tipo de probas de ensaio e preguntas tipo de probas obxectivas. En canto a preguntas de ensaio, recolle preguntas abertas de desenvolvemento. Ademais, en canto preguntas obxectivas, pode combinar preguntas de resposta múltiple, de ordenación, de resposta breve, de discriminación, de completar e/ou de asociación.

Personalized attention

Methodologies	Description
Practical test: Mixed objective/subjective test Guest lecture / keynote speech Laboratory practice Seminar	Attention through two classes presences. They will coordinate with the possibility of responding through the Microsoft Teams tool, email or moodle.

Assessment

Methodologies	Competencies	Description	Qualification
Practical test:	A86 B24 B25 B28 C9 C17	Exame práctico no laboratorio de prácticas de Biomecánica. Realizarase por parellas e consistirá en dúas preguntas de execución práctica. O/a alumno/a reproducirá o procedemento, técnica ou método explicado e desenvolvido ó longo do cuatrimestre nas clases prácticas.	20
Mixed objective/subjective test	A84 A85 A86 B24 B25 B32 B39 C9 C11 C17	Exame escrito con preguntas obxectivas e de desenvolvemento.	60
Seminar	A85 A86 B24 B39 C9	Presentación oral en horarios de clase dun traballo en grupo. Entrega dun portafolios individual ó final do cuatrimestre e realización de cinco cuestionarios ó longo do cuatrimestre.	20

Assessment comments



The percentages assigned to each test may undergo small modifications from one course to another depending on the needs of the subject.

OVERCOMING THE MATTER

To pass the subject it is necessary for the student to obtain a grade of 5 or higher in:

1- written test (mixed). It is the theoretical exam that will be carried out at the end of the semester on the date approved by the Faculty Board.

At least 50% of the assigned grade must be reached in each part

2- Practical test. The same day of the theoretical exam and then the practical exam will be carried out. STATUS OF STUDENT NOT PRESENTED

The student who, while enrolled in the subject, does not attend the different established evaluation activities, will be considered as "Not submitted" (NP).

In the absence of specific regulation for this degree (it will be followed if there is a specific regulation for the Degree in Podiatry), it will be considered that it must be qualified as "Not presented":

- a) when the continuous evaluation process is not completed or
- b) when he does not take the tests of the official evaluation period.

If the student takes only one of the final tests (written or practical), it will appear in the record as failed. If one of the parts is approved and the other is suspended, the approved part will be kept until the July call.

HONORS

Those students who obtain a 9 or higher grade may obtain honorary enrollment (MH). This rating will be awarded to the best grades, taking into account the possibility of granting an honorary enrollment for every 20 students. STUDENT WITH PARTIAL ENROLLMENT

Those students with partial enrollment will be subject to the same criteria.

SECOND OPPORTUNITY

The passing of any of the parts (theoretical or practical) through the written test or practical test by the student in the first opportunity [meaning with a grade of 5 or higher] will be saved only until the second chance. On the second opportunity, only the suspension will be examined, but if it is suspended again on this second opportunity, the one approved on the first opportunity will not be saved for the new registration. Both the theoretical and the practical part will remain pending for the following course.

SECOND REGISTRATION

The student has the right to start the evaluation process (continuous and final) from scratch. However, she can choose to have some or all of her continuous assessment scores saved.

EXTRAORDINARY CALL FOR DECEMBER

The student will be examined through a theoretical exam (mixed test) and a practical exam (practical test).

PLAGIARISM. IMPLICATIONS Fraudulent performance by the student of the tests or evaluation activities, once verified, will directly imply the qualification of fail "0" in the corresponding opportunity, thus invalidating any qualification obtained in all the evaluation activities of facing the call.

ACADEMIC DISPENSATION Those students who have been granted an academic exemption will only attend for the practical, mixed and oral presentation tests. This principle will also apply to SICUE-ERASMUS students.

The fraudulent performance of the tests or evaluation activities, once proven, will directly imply the qualification of fail in the call in which it is committed: the student will be graded with "suspense" (numerical note 0) in the corresponding call of the academic year, whether the offense is committed on the first opportunity or on the second. For this, it will proceed to modify the qualification of it in the minutes of the first opportunity, if necessary ".

FOR THE REMAINING CRITERIA NOT EXPOSED RELATING TO EVALUATION, THEY WILL FOLLOW

As RULES FOR EVALUATION, REVIEW AND CLAIM OF QUALIFICATIONS TWO
DEGREE AND UNIVERSITY MASTER'S STUDIES

Approved by the Government Council on December 19, 2013

Modified by the Government Council of April 30, 2014

Modified by the Government Council of July 24, 2014

Modified by the Government Council of January 29, 2015

Modified by the Government Council of September 28, 2016

Modified by the Government Council of June 29, 2017



Sources of information

Basic	1. Oatis, Carol A. [2017]. Kinesiology: The Mechanics and Pathomechanics of Human Movement. Philadelphia: Wolters Kluwer, 3rd ed2. Bonilla, E., Fuentes, M., Lafuente, G., Martínez, A., Ortega, A. B., & Pérez, M. (2010). Exploración básica. Guía práctica de protocolos de exploración y biomecánica. 1a ed. Madrid: Consejo General de Colegios Oficiales de Podólogos, 13-22.3. Lacuesta, J. J. S. (2005). Biomecánica de la marcha humana normal y patológica. Instituto de Biomecánica.4. Román, A. L., & Beltrán, E. L. (2003). Biofísica aplicada a la biomecánica del cuerpo humano. Bellisco, Ediciones Técnicas y Científicas.5. Gutiérrez, M. A. (2000). Biomecánica: la física y la fisiología (No. 30). Editorial CSIC-CSIC Press.6. Kirby, K. A. (2012). Biomecánica del pie y la extremidad inferior III: Artículos de Precisión Intricast, 2002-2008. III. Precision Intricast.7. de la Fuente, J. L. M. (2009). Podología general y biomecánica+ CD. Elsevier España.8. Núñez-Samper, M., & Alcázar, L. F. L. (2006). Biomecánica, medicina y cirugía del pie. Elsevier España.9. Dufour, M., & Pillu, M. (2006). Biomecánica funcional: miembros, cabeza, tronco:[bases anatómicas, estabilidad, movilidad, tensiones]. Elsevier España.10. Lesmes, J. D. (2007). Evaluación clínico-funcional del movimiento corporal humano. Ed. Médica Panamericana.11. Marrero, R. C. M., & Rull, I. M. (2005). Biomecánica clínica de los tejidos y las articulaciones del aparato locomotor. Elsevier España.12. Marrero, R. C. M., & Rull, I. M. (2006). Biomecánica clínica de las patologías del aparato locomotor. Elsevier España.13. Nordin, M., Frankel, V. H., & Forssén, K. (2004). Biomecánica básica del sistema musculoesquelético. McGraw-Hill. Interamericana.14. Nordin, M., & Frankel, V. H. (2013). Bases biomecánicas del sistema musculoesquelético. Lippincott Williams and Wilkins.15. Valmassy, R. L. (1995). Clinical biomechanics of the lower extremities. Mosby Inc.16. Plas, F., Viel, E., & Blanc, Y. (1996). La marcha humana: cinesiología dinámica, biomecánica y patomecánica.17. Busquet, L. (2012). Las cadenas fisiológicas. La cintura pélvica y el miembro inferior. Editorial Paidotribo México.18. Seibel, M. O. (1994). Función del pie: texto programado. Ortocen.19. Molina Rueda, F. (2020). La marcha humana: biomecánica, evaluación y patología. Madrid: Panamericana.
Complementary	

Recommendations

Subjects that it is recommended to have taken before

Specific Anatomy of the Lower Limb/750G02104

General Podiatry/750G02110

Biological Basis and Physical Human Movement/750G02106

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments



SUSTAINABLE DEVELOPMENT GOALS:

To help achieve an immediate sustainable contour and fulfill the objective of action number 5: "Docencia and healthy and sustainable environmental and social research" of the "Green Campus Ferrol Action Plan":

· Upon delivery of two documentary works that are carried out in this matter, they will be carried out through Moodle, in digital format without the need to print them, not in the case of being carried out on paper: plastics will not be used, double-sided printing will be carried out, recycled paper will be used and printing will be avoided of drafts.

· A sustainable use of two resources must be made and the prevention of negative impacts on the natural environment taking into account the importance of two ethical principles related to the values of sustainability in personal and professional behavior.

· Facilitate the full integration of students who, for physical, sensory, mental or sociocultural reasons, experience difficulties in a suitable, equal and beneficial access to university life.

 In the realization of two works of the material, or plagiarism and the use of non-original material, including that obtained through the Internet, without express indication of its origin and, if that is the case, or permission of its author, it will be qualified with suspense (0.0) no activity. All iso are preceded by disciplinary responsibilities rather than there may be a place after or corresponding procedure.

GENDER PERSPECTIVE:

Second, the different applicable regulations for university teaching should be incorporated into the gender perspective in this matter (non-sexist language used, bibliography of authors of both sexes used, intervention in class of male and female students encouraged...).

They will work to identify and modify prejudices and sexist attitudes and influence the environment to modify them and promote values of respect and equality.

Situations of discrimination based on gender must be detected and actions and measures to correct them must be provided.

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