Teaching Guide				
Identifying Data				2019/20
Subject (*)	Radiology and Radiation Protection		Code	750G02014
Study programme	Grao en Podoloxía			
Descriptors				
Cycle	Period	Year	Type	Credits
Graduate	2nd four-month period	Second	Obligatory	6
Language	SpanishGalician			
Teaching method	Face-to-face			
Prerequisites				
Department	Ciencias Biomédicas, Medicina e Fisioterapia			
Coordinador	Miguens Vázquez, Xoán	E-mail	xoan.miguens.vazquez@udc.es	
Lecturers		E-mail		
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General description	En esta materia se desarrollan las competencias de radiodiagnóstico y radioprotecón aplicadas a la Podología			

Study programme competences	
Code	Study programme competences
A15	Coñecer os diferentes sistemas diagnósticos, as súass características e a súa interpretación, así como a manipulación das instalacións de radiodiagnóstico podolóxico e a radio protección*. Estrutura atómica da materia. Radioactividade. Interacción dos electróns e fotóns coa materia.
A16	Desenvolver a habilidade de realizar as actividades radiolóxicas propias da podoloxía. Equipos de raios X. Magnitudes e unidades de formación de imaxes. Detección de radiacións. Control de calidade e calibración das instalacións de radiodiagnóstico. Radiobioloxía e radioprotección. Lexislación. Coñecer outras técnicas de obtención de imaxes diagnósticas do pé. Técnicas radiolóxicas. Interpretación radiolóxica.
B1	Aprender a aprender.
B2	Resolver problemas de forma efectiva.
B3	Aplicar un pensamento crítico, lóxico e creativo.
B4	Traballar de forma autónoma con iniciativa.
B15	Sensibilidade cara temas medioambientais.
B19	Capacidade de aplicar os coñecementos na práctica.
C1	Expresarse correctamente, tanto de forma oral coma escrita, nas linguas oficiais da comunidade autónoma.
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.
C6	Valorar criticamente o coñecemento, a tecnoloxía e a información dispoñible para resolver os problemas cos que deben enfrontarse.
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		
Coñecer os diferentes sistemas diagnósticos,as suas características e a sua interpretación, así como a manipulación das instalacions de radiodiagnóstico podolóxico.	A15	B1 B4 B19	C1 C6
Describir a estructura atómica da materia, o concepto de radioactividade e a interacción dos electrons e fotons coa materia.	A15	B1	C1

Realizar as actividades radiolóxicas propias da podoloxía, manexar equipos de raios X.	A16	B2 B4 B19	
Coñecer as técnicas de obtención de imáxenes diagnósticas do pe e as técnicas radiolóxicas e a sua interpretación radiolóxica	A16	B1 B4 B19	C3 C8
Coñecer as magnitudes e unidades de formación de imáxenes, os métodos de detección de radiacións e os protocolos de control de calidade e calibración das instalacións de radiodiagnóstico. Lexislación	A16	B1 B19	C6
Coñecer a radiobioloxía e a radioprotección.	A16	B15 B19	
Desenrolar a habilidade de realizar as actividades radiolóxicas propias da podoloxía	A16	B3 B4 B19	C6

Contents	
Topic	**Sub-topic**
1.-PHYSICS OF RADIATIONS	1-A: Atomic structure: Atomic structure. Atomic nuclei and radioactivity. Electromagnetic waves 1-B: Interaction of radiation with matter. Ionizing radiation: Concept and classification. X-rays: nature, production. Absorption of ionizing radiation. Interaction of photons with matter. 1-C: Magnitudes and Radiological Units
2.-X-RAY EQUIPMENT	2-A: The X-ray tube 2-B: Devices associated with the X-ray tube 2-C: Characteristics of the radiation produced by the X-ray tube 2-D: Imaging systems
3.-CONVENTIONAL RADIODIAGNOSTIC FOUNDATIONS	3-A: Geometry of the radiological image 3-B: Radiological densities: references and units of measurement 3-C: Physical Basis of X-ray 3-D: Radiological techniques and projections
4.-DETECTION AND MEASUREMENT OF RADIATIONS	4-A: Fundamentals of Radiation Detection 4-B: Dosimetry of ionizing radiation 4-C: Quality control of X-ray facilities
5.-RADIOBIOLOGY	5-A: Mechanisms of action of radiation. Cellular response 5-B: Total systemic and organic response to radiation 5-C: Effects of radiation
6.-RADIOLOGICAL PROTECTION	6-A: General radiological protection criteria 6-B: Operational radiological protection 6-C: Radiological specific protection in radiodiagnosis: general aspects 6-D: Particular aspects of the protection of patients and operating personnel in different radiodiagnostic units 6-E: Quality assurance in radiodiagnostic facilities

7.-LEGISLATION ON RADIODIAGNOSTIC INSTALLATIONS	7-A: General legal aspects and administration 7-B: Legal and administrative aspects at the national level. Technical and administrative management of facilities and personnel. Guidelines and standards at European level.
8.-IMAGING DIAGNOSIS	8-A: Radiology: Conventional Radiology. CT scan. Digital Radiology. 8-B: Ultrasound. Doppler 8-C: Magnetic Resonance 8-D: Nuclear Medicine 8-E: Methods of support in diagnostic imaging
9.-THERAPEUTIC INSTRUMENTATION	9-A: Interventional Radiology 9-B: Ultrasound
10.-RADIODIAGNOSIS IN PODOLOGY	10-A: Radiological anatomy of the foot and lower limb 10-B: Basic projections of the foot and lower limb 10-C: Other radiological projections of the foot and lower limb 10-D: Other imaging techniques in podiatry

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	B1	21	42	63
Seminar	B2 B3 B4 B15	10	20	30
Case study	A15 A16 B19	7	14	21
Supervised projects	C3 C6 C8	4	20	24
Oral presentation	C1	2	8	10
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
Guest lecture / keynote speech	Oral presentation complemented by the use of audiovisual media and the introduction of some questions addressed to students, with the purpose of transmitting knowledge and facilitating learning. The master class is also known as "lecture", "expository method" or "master lesson". The latter modality is usually reserved for a special kind of lesson given by a teacher on special occasions, with content that is an original elaboration and based on the almost exclusive use of the word as a way of transmitting information to the audience.
Seminar	Group work technique with the purpose of intensive study of a theme. It is characterized by the discussion, the participation, the elaboration of documents and the conclusions to which all the components of the seminar have to reach
Case study	Methodology where the subject faces the description of a specific situation that raises a problem that has to be understood, valued and solved by a group of people, through a process of discussion. The student is faced with a specific problem (case), which describes a real situation of professional life, and must be able to analyze a series of facts, referring to a particular field of knowledge or action, to reach a Reasoned decision through a process of discussion in small work groups.
Supervised projects	Metodología diseñada para promover el aprendizaje autónomo de los estudiantes, bajo la tutela del profesor y en escenarios variados (académicos y profesionales). Está referida prioritariamente al aprendizaje de ?cómo hacer las cosas?. Constituye una opción basada en la asunción por los estudiantes de la responsabilidad por su propio aprendizaje. Este sistema de enseñanza se basa en dos elementos básicos: el aprendizaje independente de los estudiantes y el seguimiento de ese aprendizaje por el profesor-tutor.
Oral presentation	Intervention inherent in the teaching-learning processes based on verbal exposure through which students and teachers interact in an orderly manner, proposing questions, clarifying and exposing themes, works, concepts, facts or principles in a dynamic way.

Personalized attention	
Methodologies	**Description**
Oral presentation Supervised projects	A atención personalizada realizarase mediante titorías personalizadas directas e virtuais a demanda, e previa cita, individuais e grupais.

Assessment			
Methodologies	**Competencies**	**Description**	**Qualification**
Guest lecture / keynote speech	B1	Examen por escrito tipo test de resposta única	70
Oral presentation	C1	O obxeto da presentación oral será a exposición en clase por todos os membros do grupo que realiza os traballos	5
Supervised projects	C3 C6 C8	Realizados en grupos reducidos sobre un tema da asignatura recomendado polo profesor.	10
Seminar	B2 B3 B4 B15	Os contidos impartidos nos seminarios serán obexto de valoración na proba escrita	10
Case study	A15 A16 B19	Na proba escrita incluiranse varias preguntas relacionadas co estudo de casos prácticos	5

Assessment comments
Los aspectos y criterios que se tendrán en consideración al evaluar las actividades que se harán entorno a dicha metodología son la asistencia, participación y compromiso individual y grupal, coherencia de los contenidos abordados, conocimientos demostrados en los exámenes teóricos y prácticos y competencias referidas para esta asignatura. El sistema de calificaciones se expresará mediante calificación numérica de acuerdo con lo establecido en el art. 5 del Real Decreto 1125/2003 de 5 de septiembre (BOE 18 de septiembre), por el que se establece el sistema europeo de créditos y el sistema de calificaciones en las titulaciones universitarias de carácter oficial y la validez en todo el territorio nacional. Sistema de calificaciones: 0-4.9=Suspenso 5-6.9=Aprobado 7-8.9=Notable 9-10=Sobresaliente 9-10 Matrícula de Honor (Graciable)

Sources of information	
Basic	- Juan R Zaragoza (1992). Física e instrumentación médicas. Barcelona. Masson-Salvat - Francisco J Cabrero Fraile (2004). Imagen radiológica: principios físicos e instrumentación. Barcelona. Masson - Kenneth L. Bontrager (2006). Proyecciones radiológicas con correlación anatómica. Madrid. Elsevier - Thomas H Berquist (2002). Radiología de pie y tobillo. Madrid. Marbán Libors S.L - La Trobe University (). http://www.latrobe.edu.au/podiatry/Radiology/radiologyindex.html. - Universidad Autónoma de Barcelona (). http://www.radiologico.org/archivo/index.php.
Complementary	

Recommendations
Subjects that it is recommended to have taken before
General Human Anatomy /750G02001 Specific Anatomy of the Lower Limb/750G02002 General Pathology/750G02008
Subjects that are recommended to be taken simultaneously
Subjects that continue the syllabus
Other comments

1.- Recommendations for environmental sustainability.To help achieve a sustainable immediate environment and meet the strategic objectives 1 and 2 of the "III Plan of Action of the Green Campus FCS Program (2018-2020)" the documentary works that are carried out in this subject:- Mostly, they will be requested in virtual format and computer support.b.- To be made on paper:- Plastics will not be used.- Double-sided impressions will be made.- Recycled paper will be used.- Drafting will be avoided.2.- Case of fraud detection, copies or penalties.In the event of detecting fraud, copy or plagiarism in the writing of the subject's work, it will imply a suspension of the opportunity of evaluation affected (0.0) and direct remission to the next opportunity. This attitude will be communicated to the Academic Committee and the rest of the professors of the degree. In case the irregularity is reiterated in a 2nd evaluation, the Commission may request the Rector the temporary or perpetual expulsion of the student from the degree course.