

**1. General information****Course:** IMAGE DIAGNOSIS AND RADIOPROTECTION**Type:** CORE COURSE**Degree:** 399 - PODIATRY DEGREE**Center:** 16 - FACULTY OF SCIENCES OF THE HEALTH OF TALAVERA**Year:** 3**Main language:** Spanish**Use of additional languages:****Web site:****Code:** 32525**ECTS credits:** 6**Academic year:** 2023-24**Group(s):** 60 61**Duration:** C2**Second language:****English Friendly:** Y**Bilingual:** N**Lecturer:** IGNACIO PÉREZ GURBINDO - Group(s): 60 61

Building/Office	Department	Phone number	Email	Office hours
	CIENCIAS MÉDICAS		Ignacio.PGurbindo@uclm.es	

2. Pre-Requisites

Not established

3. Justification in the curriculum, relation to other subjects and to the profession

The Image Diagnosis and Radioprotection subject teaches basic notions of obtaining images that help in podiatric diagnosis, as well as atomic physics necessary to understand how ionizing radiation is produced and how it interacts with matter, with the purpose of understanding the biological effects that can cause in our body. This will allow us to understand the need for radiological protection, its principles and its purpose against this type of radiation. The above is complemented by the need to develop skills to carry out the radiological activities of Podiatry.

It is offered within the Biomechanics and General Podiatry module, being transversally related to the different subjects that make up the Degree.

4. Degree competences achieved in this course**Course competences**

Code	Description
CB01	Prove that they have acquired and understood knowledge in a subject area that derives from general secondary education and is appropriate to a level based on advanced course books, and includes updated and cutting-edge aspects of their field of knowledge.
CB02	Apply their knowledge to their job or vocation in a professional manner and show that they have the competences to construct and justify arguments and solve problems within their subject area.
CB03	Be able to gather and process relevant information (usually within their subject area) to give opinions, including reflections on relevant social, scientific or ethical issues.
CB04	Transmit information, ideas, problems and solutions for both specialist and non-specialist audiences.
CB05	Have developed the necessary learning abilities to carry on studying autonomously
CE18	Knowing the different diagnostic systems, their characteristics and their interpretation, as well as the manipulation of podiatric radiodiagnosis facilities and radio protection. Atomic structure of matter. Radioactivity. Interaction of electrons and photons with matter.
CE19	Develop the ability to perform the radiological activities of podiatry. X-ray equipment. Magnitudes and imaging units. Radiation detection Quality control and calibration of radiodiagnostic facilities. Radiobiology and radioprotection. Legislation. Know other techniques for obtaining diagnostic images of the foot. Radiological techniques. Radiological interpretation.
GC03	Obtain the capacity, skill and ability necessary to diagnose, prescribe, indicate, perform and/or develop and evaluate any type of podiatric, orthopodological, surgical, physical, pharmacological, preventive and/or educational treatment, based on the clinical history.

5. Objectives or Learning Outcomes**Course learning outcomes****Description**

To develop the ability to adequately carry out the techniques and procedures necessary to obtain podiatric radiological images.

To know the techniques and procedures necessary to obtain echographic images in Podiatry.

To know the different diagnostic systems, their characteristics and their interpretation, as well as the handling of podiatric radiodiagnostic facilities and radioprotection. Atomic structure of matter. Radioactivity. Interaction of electrons and photons with matter.

To identify the normal characteristics of the anatomical structures of the foot in the different diagnostic imaging tests (radiology, MRI, CT, ultrasound and scintigraphy).

To identify the findings that suggest the presence of foot pathology in the different diagnostic imaging tests (radiology, MRI, CT, ultrasound, and scintigraphy) and be able to correlate these findings with the underlying pathological process and the anatomical structure/s of those who suffer from it.

6. Units / Contents**Unit 1: Introduction**

Unit 1.1 Presentation and scholar calendar of the subject.

Unit 2: FUNDAMENTALS OF DIAGNOSTIC IMAGING.

Unit 2.1 History of radiology. Concepts and definitions.

Unit 2.2 Anatomical structure: atomic nuclei and radioactivity. Electromagnetic waves.

Unit 2.3 Interactions of electrons and protons with matter: nature, production and absorption of radiation.

Unit 2.4 Magnitudes and units of radiation.

Unit 2.5 X-ray equipment: X-ray tube and characteristics of its X-ray radiation. Imaging systems and digital imaging.

Unit 2.6 Formation of the radiological image.

Unit 2.7 Radiation detection

Unit 3: FUNDAMENTALS OF RADIOPROTECTION.

Unit 3.1 Quality control in radiology: calibration of facilities and detectors.

Unit 3.2 Radiobiology: biological effects and responses to radiation.

Unit 3.3 Generalities on specific radiological protection in radiodiagnosis.

Unit 3.4 Operational radiation protection.

Unit 3.5 Radiological protection of the patient and staff in the different radiodiagnostic units.

Unit 4: LEGISLATION ON RADIODIAGNOSTIC FACILITIES.

Unit 4.1 General legal and administrative aspects of radiodiagnosis facilities.

Unit 4.2 Particularities of the general legal and administrative aspects of radiodiagnostic facilities in podiatry: requirements, technical management and staff of the facilities.

Unit 5: RADIODIAGNOSTIC.

Unit 5.1 X-Ray

Unit 5.2 Magnetic Resonance

Unit 5.3 Computerized Tomography

Unit 5.4 Sonography

Unit 5.5 Doppler

Unit 5.6 Gammagraphy

Unit 5.7 Arthrography and Arteriography

Unit 6: RADIODIAGNOSTIC IN PODIATRY.

Unit 6.1 Radiological anatomy of the lower limbs and specific foot.

Unit 6.2 Radiological projections of the lower limbs and specific foot.

Unit 6.3 Generalities about the interpretation in radiodiagnosis.

Unit 6.4 Radiodiagnosis of the main hip and leg pathologies.

Unit 6.5 Radiodiagnosis of the main foot pathologies: childhood, adolescence, adulthood and old age.

Unit 6.6 Radiodiagnosis in the risk foot.

7. Activities, Units/Modules and Methodology							
Training Activity	Methodology	Related Competences (only degrees before RD 822/2021)	ECTS	Hours	As	Com	Description
Class Attendance (theory) [ON-SITE]	Lectures	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	1.6	40	Y	N	Evaluation in the final exam.
Problem solving and/or case studies [ON-SITE]	Combination of methods	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	0.6	15	Y	Y	Seminars, workshops and/or group practices for solving problems and/or cases and simulation work. The contents will be evaluated within the evaluation system Final Test and/or Practices. Unrecoverable. Absences justified by force majeure may not exceed 30% of scheduled activities.
Final test [ON-SITE]	Assessment tests	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	0.12	3	Y	Y	Evaluation in the final exam.
Project or Topic Presentations [ON-SITE]	Individual presentation of projects and reports	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	0.08	2	Y	N	Reports, tasks or works derived from the workshops or seminars. Assessed within the Practice assessment system. Unrecoverable.
Writing of reports or projects [OFF-SITE]	Group tutoring sessions	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	1	25	Y	N	Reports, tasks or works derived from the workshops or seminars. Assessed within the Practice assessment system. Unrecoverable.
Study and Exam Preparation [OFF-SITE]	Self-study	CB01 CB02 CB03 CB04 CB05 CE18 CE19 GC03	2.6	65	Y	N	Evaluation in the final exam.
Total:			6	150			
Total credits of in-class work: 2.4			Total class time hours: 60				
Total credits of out of class work: 3.6			Total hours of out of class work: 90				

As: Assessable training activity

Com: Training activity of compulsory overcoming (It will be essential to overcome both continuous and non-continuous assessment).

8. Evaluation criteria and Grading System			
Evaluation System	Continuous assessment	Non-continuous evaluation*	Description
Final test	70.00%	70.00%	The final test will be multiple choice and the formula used to establish the score is as follows: Final test score=((Hits-(Wrongs/2))/(Total questions)) x 10.
Practical exam	30.00%	30.00%	Resolution of problems or cases. Jobs, reports or topics. The student must attend scheduled group activities.

Total:	100.00%	100.00%	
---------------	----------------	----------------	--

According to art. 4 of the UCLM Student Evaluation Regulations, it must be provided to students who cannot regularly attend face-to-face training activities the passing of the subject, having the right (art. 12.2) to be globally graded, in 2 annual calls per subject, an ordinary and an extraordinary one (evaluating 100% of the competences).

Evaluation criteria for the final exam:

Continuous assessment:

The grading system in force at all times will be applied; Currently, UCLM student evaluation regulations, approved on May 23, 2022.

The Global evaluation will be carried out based on the weighted average of the evaluation systems (Final test and practices). The student must reach 40% of the final test.

Non-continuous evaluation:

The grading system in force at all times will be applied; Currently, UCLM student evaluation regulations, approved on May 23, 2022.

The Global evaluation will be carried out based on the weighted average of the evaluation systems (Final test and practices). The student must reach 40% of the final test.

Specifications for the resit/retake exam:

The assessment of the practices, which have been passed by the student up to a maximum of two academic years from the current course, will be kept, provided that the training activities are not modified.

9. Assignments, course calendar and important dates	
Not related to the syllabus/contents	
Hours	hours

10. Bibliography and Sources						
Author(s)	Title/Link	Publishing house	Citv	ISBN	Year	Description
Francisco J. Cabrero Fraile	Imagen radiológica: principios físicos e instrumentación	Masson		9788445814505	2004	
William Herring	Radiología Básica	Elsevier		9788491136651	2020	
Peter Fleckenstein Jorgen Trandum-Jensen	Bases anatómicas del diagnóstico por imagen	Elsevier		9788491130000	2016	
Thomas H. Berquist	Radiología de Pie y Tobillo	Marbán		9788471013436	2002	
Juan Ramón Zaragoza	Físicas e instrumentación médica	Masson		9788445800171	1991	
Draghi, F.	Ultrasonography of the Lower Extremity. Sport-Related Injuries	SPRINGER		9783030149901	2019	
Chuto, G.	Bone SPECT/CT of Ankle and Foot	SPRINGER		9783319908106	2018	
López-Moranchel, I.	Protección Radiológica	SINTES		9788413572796	2023	