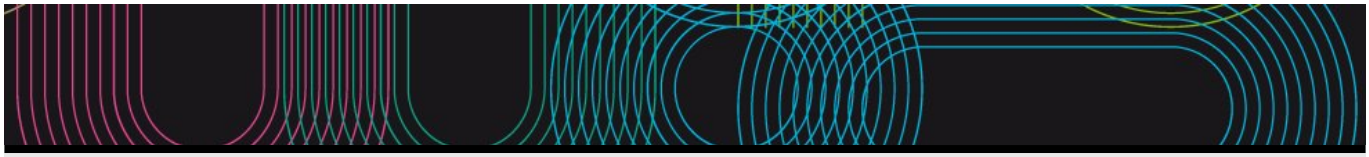

IDENTIFYING DATA				
Radiology				
Subject	Radiology			
Code	P05G171V01208			
Study programme	Grado en Fisioterapia			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	6	Mandatory	2nd	2nd
Teaching language				
Department				
Coordinator	García Pomar, Dionisio			
Lecturers	García Pomar, Dionisio			
E-mail	dionisio.garcia.pomar@xunta.es			
Web				
General description	Radiology or Imaging Diagnosis has been defined as: Medical specialty that participates in the diagnostic decision of patients through images, directing the sequence, carrying out the obtaining techniques and interpreting the results obtained. Likewise, interventionist techniques in which the use of the image is simultaneous fit within it. Radiological images provide documentary evidence for diagnosis. The impact of radiology on the clinical management of hospitalized patients is very high since 80% of clinical decisions are based on radiological tests. It is necessary to point out a general consideration regarding this matter and that is that Radiology's ultimate goal is the diagnosis and treatment of diseases and this notion of clinical activity that operates on people clearly elevates and separates it from the purely rationalist and scientist of the basic sciences and gives it a human dimension that must permeate, clearly, the whole of its teaching. The doctrinal body of radiology is multidisciplinary and subject to constant innovation. It is heterogeneous and complex since it brings together such disparate teachings that they constitute individualized specialties in the current practice of health care. Therefore, it is intended to provide the student with a panoramic vision of the care environment of these specialties so that the future professional knows what are the possibilities and limitations of the corresponding techniques, their fundamental indications, and their special language, so that they know the report of a specialist and interpret the most common radiological images. The Radiology Guide and the programming have been modified to adapt to the R.D. 822/2021 in terms of basic, general, specific and transversal competences, and for its adaptation to the "Regulation on assessment, qualification and quality of teaching and the student learning process" (Claustro UVIGO 04/18/2023).			

Training and Learning Results	
Code	
A2	Students are able to apply their knowledge to their work or vocation in a professional manner and possess the competences usually demonstrated through the development and defence of arguments and problem solving within their field of study.
B1	To know how to work in professional teams as a basic unit in which professionals and other personnel of health care organizations are structured in a uni or multidisciplinary and interdisciplinary way.
B3	Communicate effectively and clearly, both orally and in writing, with users of the health system as well as with other professionals.
C7	Know the physiological and structural changes that can occur as a result of the application of physiotherapy.
C29	To know the ethical and legal bases of the profession in a changing social context.
C31	Know the structure of the human body and identify structural elements and alterations of normality in the different methods of analysis and diagnosis through imaging.
C34	To know and understand the morphology, physiology, pathology and behavior of people, both healthy and sick, in the natural and social environment.
D1	Ability to communicate orally and in writing in Galician.
D2	Computer skills related to the field of study
D5	Developing leadership and organizational skills.
D7	Maintain an attitude of learning and improvement.

Expected results from this subject				
Expected results from this subject	Training and Learning Results			
New	A2		C34	
New	A2		C34	
New		B1 B3		D2 D5
New	A2	B3	C29 C34	D7
New	A2		C29 C31	
New			C29 C34	
New	A2		C31 C34	
New	A2	B3	C31	
New	A2	B3	C7 C31	
New	A2		C31 C34	D2
New	A2	B1 B3	C34	D1 D5

Contents	
Topic	
Subject 1.- Introduction to the Radiology	1: Global Plan of the matter: Aims of the matter Radiology in the Degree of Physiotherapy, contents, educational methodology, bibliography, recommended links in the web, preparation of a work, dates of examinations, systems of evaluation and criteria. Conceptual approximation to the Radiology and Physical Medicine in the educational field and clinical.
Subject 2.- The diagnostic. Clinical field of a service of diagnostic by the image.	2: Location of the Radiology in the clinical surroundings, instrumental Explorations, Technicians of diagnostic by the image, Strategy in diagnostic by the image, The service of diagnostic by the image, Agencies of technological evaluation, evaluation of the technicians of diagnostic by image.
Subject 3.- The electromagnetic radiation. Basic concepts.	3: The X-rays, Nature, Origin, Properties, Production. The team generator of X-rays. Interaction of the electrons with the target, Continuous Spectrum, characteristic Spectrum. Parameters that influence in the spectrum.
Subject 4.- Interaction of the radiation with the human organism.	4: Interaction of the X-rays with the alive matter.- Mitigation. Photoelectric effect. Dispersion Compton. The radiological imaging of projection. Geometry of the image. Concept of contrast and definition in the image. Development of the medical applications of the X-rays.
Subject 5.- Detection and measure of the radiation. *Radioprotección. Justification of an exploration.	5: Utility of the Ioniting Radiations. Assessment of the index benefit / risk. The Radiological Protection: origin and development. Aim of the Radiological Protection. Criteria of Radiological Protection. Radiobiology. General recommendations for the reduction of dose to the patient. Control of Quality in Radiology. Justification of the indication of a radiological test.
Subject 6.- The radiological image. Contrast media in radiology. Radiological techniques.	6: The radiológical image in the technicians of projection. Evolution systems of image, general classification of the radiológical images with regard to his origin, Systems of supports of image.
Subject 7.- Interpretation. Basic semiology.	7: DICOM Format (Digital Imaging and Comunicatión in Medicine). Parameters of quality of the image. The image like bearer of information. The process of interpretation of the image. Basic semiology.
Subject 8.- Echography. Generalities. Instrumentation. Modalities.	8: The ultrasounds in diagnostic by the image, Echography, development. Foundamentals of the Echography, Echography mod A, mod B, mod T-M. Echo-3D, Echography of High resolution. Endoluminal Echography.
Subject 9.-Döppler Echography: Types. Semiology and indications.	9: Doppler fundamentals, Colour Doppler Echography. Power-Doppler, Advantages of the diagnostic echography, semiology, indications.
Subject 10.- Axial computer tomography. Basis of the TC. Types.	10: physical Foundations and obtaining of image. Generations of units TC.
Subject 11.- Axial computer tomography. Bases of the TC. Types.	11: The unit of TC, Studies with contrast, New study techniques by means of TC multislice. Indications.
Subject 12.- Magnetic resonance (RM): Generalities.	12: Physical Fundamentals of the nuclear magnetic resonance, The values of relaxation, The longitudinal relaxation of T1, The transversal relaxation of T2.

Subject 13.- Magnetic resonance. Basic semiology and indications.	13: Acquisition of image, Components of a unit of resonance for clinical diagnostic, paramagnetics contrasts, vascular studies, the images in RM, RM functional, Advantages and inconvenients. Basic semiology and indications.
Subject 14.- Nuclear medicine. Radiotracers And radiofarmaceuticals.	14: Foundamentals of the Nuclear Medicine, radioactive Isotopes, radiofarmaceuticals, Systems of detection and obtaining of image.
Subject 15.- Nuclear medicine. Morphological and functional studies with isotopes of the main organs and devices.	15: Types of studies in MN, Examples of explorations.
Subject 16.- Nuclear medicine. Isotopic studies. SPECT, PET and other technicians. Indications and basic semiology	16: Positron Emission Tomography (PET). Current expansion of the PET and clinical applications.
Subject 17.- Osseous densitometry.	17: Character of the Illness. Current impact and prediction to 50 years. Social surroundings of the Problem. Specific performances in Osteoporosis. Osteopenia. Osteoporosis. Diagnostic and follow-up of the patient with Osteoporosis. Study of the osseous Mass. Methods of evaluation of the osseous Mass.
Subject 18.- Interventional Radiology .	18: Technicians of Interventional Radiology. Clinical Impact of the Interventional Radiology. Forecast of expansion of the technicians of Interventional Radiology. Procedures: Endovascular, Extravascular, Oncológical. Radiological Protection in the Interventional Radiology.
Subject 19.- Studies of image in the thorax: technicals, indications, basic semiology.	19: Basic Technics of image of projection, complementary Technics. Basic indications of the simple study. Radiological Examination of urgencies. Constituents of the radiological image. Basic semiology.
Subject 20.- Studies of image in the abdomen and digestive device: technicals, indications, basic semiology.	20: basic Technicals of image of projection, complementary Technicals. Basic indications of the simple plates and studies with contrast. Constituents of the radiological image. Basic semiology.
Subject 21.- Musculoskeletal Studies: technicals, indications, basic semiology.	21: Indications of musculoskeletal studies: simple Radiology, computer Tomography, Magnetic Nuclear Resonance, osseous Gammagraphy.
Subject 22.- Musculoskeletal studies: basic semiology.	22: Echography. Studies of image in traumatisms. Studies of image in articulations. Tumors.
Subject 23.- Studies of image in the kidney and urinary roads: technicians, indications, basic semiology.	23: Studies of simple radiology, computer tomography, Magnetic Nuclear Resonance, osseous Gammagraphy, Echography. Basic semiology in kidney and urinary roads.
Subject 24.- Studies of image in the nervous system and in the circulatory system: technicians, indications, basic semiology.	24: Studies of simple radiology, computer tomography, Magnetic Nuclear Resonance, osseous Gammagraphy, Echography. Basic semiology in central nervous system, in heart and circulatory system.
Subject 25.- Principles of radiotherapy in oncology	25: Introduction, Irradiation of a patient with a neoplasia, fractionation of the total dose, modalities of treatment, Machines of external radiotherapy or teleradiotherapy, superficial Radiotherapy, Radiotherapy semi-deep, deep Radiotherapy, Generators of gamma rays, accelerators of electrons, Technicals of teleradiotherapy, Brachiterapy, Indication of the Radiotherapy.

Planning

	Class hours	Hours outside the classroom	Total hours
Lecturing	27	44	71
Laboratory practical	18	40	58
Presentation	2	10	12
Practices through ICT	0	5	5
Introductory activities	1	0	1
Essay questions exam	1	0	1
Objective questions exam	0.6	0	0.6
Laboratory practice	0.4	0	0.4
Presentation	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

	Description
Lecturing	The teacher explains the theoretical foundations. The student takes notes, raises doubts and complementary questions.
Laboratory practical	The teacher presents the images, guides in the observation, supports with the clinical environment, helps in the assessment. The student observes, assesses, participates, assimilates and prepares a catalog of studied cases.

Presentation	The teacher provides instructions, advises on the choice of a topic, provides a bibliography, performs individualized follow-up, clears up doubts, assesses results. The student delves into a subject, performs a bibliographic review in clinical publications, repairs an abstract and presents it in PWP.
Practices through ICT	The teacher provides three normal radiological image bank programs that allow students to interact with spatial orientation and radioanatomy references. Explain its operation. The student uses the programs on his personal computer.
Introductory activities	The contents of the subject are distributed in six blocks: -General introduction. -Basics of radiology. -Diagnosis by image according to the various radiological procedures. -Radiology applied to Physiotherapy. -Radiobiology and radiological protection. -Radiotherapy. The established objectives. Allocated credits and their distribution. the bibliography available. The form of final evaluation and its weighting.

Personalized assistance

Methodologies	Description
Laboratory practical	Registration on the MooVi platform to monitor the matter. Orientation tutorials and individual follow-up during tutoring hours. Resolution of doubts regarding the operation of the multimedia tutorials that are provided in CD format or available on the web.
Presentation	Guidance tutorials on the scope and contents of the work. Guardianship and review of individual work, during its preparation.
Practices through ICT	Orientation on the operation of the platforms of image in the web and follow-up of clinical cases.

Assessment

	Description	Qualification	Training and Learning Results			
Essay questions exam	Written development exam on the syllabus that includes open questions on a topic. The students must develop, relate, organize and present the knowledge they have on the subject in a reasoned response. To pass the exam, a score of 5 out of 10 must be obtained. The development questions exam and the objective questions exam must be passed independently.	40	A2	B3	C7 C29 C31 C34	D1 D7
Objective questions exam	The examination consists of billed with different alternative of answer. The wrong questions will be penalised.	30	A2	B1 B3	C7 C29 C31 C34	D1 D7
Laboratory practice	Evaluation of laboratory practices. Study of cases. Autonomous practices through ICTs. Control and monitoring of cases. The exam consists of a description of images of various radiological techniques without pathology that were explained in practical sessions and in ICT programs. The exam translates the application of the theoretical foundations of the subject. It is mandatory to attend the practices to pass them.	20	A2	B1	C7 C29 C31 C34	D2 D7
Presentation	Evaluation of the student's work carried out on the review of a radiological topic, its bibliographic review, the quality of the radiological images, its description, the discussion about the results, the quality of its exposure in PWP. The exhibition and defense of the work is mandatory. In the case of not developing the work or the corresponding defense, the matter will not be passed.	10	A2	B1 B3	C7 C31 C34	D1 D2 D5 D7

Other comments on the Evaluation

CONTINUOUS ASSESSMENT

The continuous evaluation is proposed in a first partial phase, once the basic theoretical contents have been completed, and another partial evaluation in an ordinary call.

PARTIAL 1º Written tests (theoretical): 35%

Basic theoretical contents of the first seven topics.

Development questions exam: 20%

Objective questions exam: 15%.

PARTIAL 2º Written tests (theoretical): 35%

Clinical contents of Radiology.

Development questions exam: 20%

Objective questions exam: 15%.

Total theoretical evaluations (partial 1 + partial 2): 70%.

Laboratory practices: 20%

Work: 10%

OVERALL EVALUATION

By expressly waiving continuous evaluation: In this case, partial evaluations will not be carried out, so that in ordinary call the students will be evaluated according to the

following way:

Development questions exam: 40%

Objective questions exam: 30%.

Both exams (objective and development questions) must be passed independently.

Laboratory practices: 20%

Work: 10%

Students who do not want to follow the continuous assessment must notify them in writing following the procedure established by the Faculty of Physiotherapy. Waiver of continuous assessment must be made in the 5th week of teaching, which

which means that they will assume the global evaluation established in the subject.

Once the Faculty decides to waive continuous assessment, the student will not have the option to do so, nor to the considerations established therein.

EXTRAORDINARY EVALUATION - RECOVERY:

Students who have passed one of the partial exams in the continuous assessment (partial 1 or partial 2), in the extraordinary assessment must only take the partial exam that they did not pass. Students who have failed both partial exams in the continuous assessment will have the same percentages and criteria as the global assessment students in the extraordinary assessment, according to the scale detailed below.

For the extraordinary evaluation, a battery of objective questions is not specifically prepared. The examination of development questions increases around a third of the questions.

The total scale is:

Development questions exam: 70%

Laboratory practices: 20%

Work: 10% (the grade obtained will be maintained)

Sources of information

Basic Bibliography

José Luis del Cura, **Radiología Esencial**, 2ª, Editorial Panamericana, 2019
Adam Greenspan, **Radiología de huesos y articulaciones**, 1ª, MARBAN Libros S.L., 2007
Nigel Raby, Laurance Berman, Gerald de Lacey, **Radiología de Urgencias y Emergencias, Manual de supervivencia**, 2ª, Elsevier, 2006
Fleckenstein P., Tranum-Jensen J., **Bases anatómicas del diagnóstico por imagen**, 3ª, Elsevier, 2016
González J., Delabat R.G., **Tecnología radiológica**, 1ª, Paraninfo, 1996
Monnier J.P., **Manual de Radiodiagnóstico**, 3ª, Masson, S.A., 1994
William Herring, MD, FACR, **Radiología básica. 4ª Edición 2020 Aspectos fundamentales**, 4ª, Elsevier, 2020

Complementary Bibliography

Recommendations

Subjects that it is recommended to have taken before

Human anatomy: Human anatomy/P05G171V01101
Physiology: Human physiology/P05G171V01102