VNIVERSITAT DE VALÈNCIA

Course Guide
34463 Clinical radiology, physical medicine and rehabilitation

COURSE DATA

DATA SUBJECT

Code: 34463
Name: Clinical radiology, physical medicine and rehabilitation
Cycle: Undergraduate Studies
ECTS Credits: 6
Academic year: 2025-26

STUDY (S)

Degree	Center	Acad. year	Period
1204 - Degree in Medicine	Facultat de Medicina i Odontologia	4	First quarter

SUBJECT-MATTER

Degree	Subject-matter	Character
1204 - Degree in Medicine	Diagnostic and therapeutic procedures	COMPULSORY

COORDINATION

DUALDE BELTRAN DELFINA

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SUMMARY

Theoretical-practical formation of future doctors in the field of the Clinical Radiology. The students, at the end of the course, must acquire the basic knowledge about the semiology foundations of the techniques used in Radiology and Diagnosis Imaging (Radiodiagnosis and Nuclear Medicine) in every organ and system, to know the most used image explorations in the study of the different corporal systems, their profitability and the use of the image in the clinical practice guides focused on each of the pathologies of the different organs and systems. The student must also know the therapeutic applications of the therapy guided by image and based on nuclear medicine.

PREVIOUS KNOWLEDGE

RELATIONSHIP TO OTHER SUBJECTS OF THE SAME DEGREE

There are no specified enrollment restrictions with other subjects of the curriculum.

OTHER REQUIREMENTS

It is advisable to have passed General Radiology.

COMPETENCES / LEARNING OUTCOMES

1204 - Degree in Medicine

Acknowledge diversity and multiculturality.

Acquire properclinical experience in hospitals, health care centres and other health institutions, under supervision, as well as basic knowledge of clinical management focused on the patient and the correct use of tests, medicines and other resources available in the health care system.

Assesses indications and contraindications of radiological studies.

Be able to formulate hypothesis, gather information and evaluate it critically in order to solve problems by following the scientific method.

Capacity for communicating with professional circles from other domains.

Consideration of ethics as a fundamental value in the professional practise.

Criticism and self-criticism skills.

Establish a good interpersonal communication which may allow professionals show empathy and talk to the patients efficiently,as well as to their relatives, the media and other professionals.

Establish the diagnosis, prognosis and treatment, applying principles based on the bestinformation available and on conditions of clinical safety.

Evaluate the risk-benefit balance of diagnostic and therapeutic procedures.

Have the capacity to make an initial diagnosis and establish a reasonable strategy of diagnosis.

In the professional practise, take a point of view which is critical, creative, constructive and research-oriented.

Is able to apply radiological protection criteria within the diagnostic and therapeutic procedures with ionising radiation.

Is able to interpret a radiological image through systematic reading.

Is aware of the indications in biochemical tests, as well as haematological, immunological, microbiological, anatomical and pathological, and image tests.

Keep and use medical records which contain information about the patient for later analysis, preserving the confidentiality of personal data.

Know how to use IT in clinical, therapeutic and preventive activities, and those of research.

Know how to use the sources of clinical and biomedical information available, and value them critically in

order to obtain, organise, interpret and communicate scientific and sanitary information.

Knows other techniques to obtain diagnostic image.

Knows the foundations of radiation interaction with the human body.

Knows the principles and indications of radiotherapy.

Proper organisation and planning of the workload and timing in professional activities.

Team-working skills and engaging with other people in the same line of work or different.

Understands the foundations of basic radiological semiology of various organs and systems.

Understand the foundations of action, indications and efficacy of therapeutic interventions, based on available scientific evidence.

Understand the importance and the limitations of scientific thinking in the study, prevention and management of diseases.

Working capacity to function in an international context.

DESCRIPTION OF CONTENTS

1. Introduction to radio diagnosis: digital image and storage systems. The revolution of the image in personalized medicine. Information and general plan of the course.

2. Diagnosis imaging in the central nervous system diseases. Techniques of structural and functional neuro-images. CT and MR: historical evolution, advantages, disadvantages, main sequences and indications.

3. Diagnostic imaging in head and neck diseases. Imaging techniques. Skull base, orbit and temporal bone.

4. Diagnostic imaging in diseases of the facial and cervical region. Inflammatory disorders. Bone lesions. Benign and malignant tumors. Lymphadenopathies.

5. Diagnosis imaging in the pulmonary parenchyma diseases. Image techniques. Air space disease. Pulmonary collapse. Interstitial pulmonary disease. Air ducts disease. Nodules and pulmonary masses.

6. Diagnosis imaging in the mediastinum and pleura diseases. Image techniques. Thoracic aorta. Mediastinum. Pleura, thoracic wall and diaphragm.

7. Diagnostic imaging in diseases of the heart. Ischemia, valve disease, cardiomyopathies, masses and tumors. Pericardium.

8. Diagnostic imaging in diseases of the liver, bile duct and pancreas. Diagnosis and staging of the main tumors. Inflammatory and storage diseases. Image in gallbladder and bile duct injuries (I).

9. Imaging diagnosis in diseases of the liver, bile duct and pancreas. Diagnosis and staging of the main tumors. Inflammatory and storage diseases. Image in gallbladder and bile duct injuries (II).

10. Diagnostic imaging in diseases of the urinary and adrenal system. Tumor, inflammatory and obstructive lesions of the kidney and urinary system. Adrenal injuries and tumors. Male genital system, including lesions of the prostate (I).

11. Diagnostic imaging in diseases of the urinary and adrenal system. Tumor, inflammatory and obstructive lesions of the kidney and urinary system. Adrenal injuries and tumors. Male genital system, including lesions of the prostate (II).

12. Diagnostic imaging in diseases of the digestive tract and peritoneum. Image of the main tumors, inflammatory and ischemic lesions of the digestive tract. Contribution of the image to peritoneal and mesenteric lesions (I).

13. Diagnostic imaging in diseases of the digestive tract and peritoneum. Image of the main tumors, inflammatory and ischemic lesions of the digestive tract. Contribution of the image to peritoneal and mesenteric lesions (II).

14. Diagnostic imaging in women's diseases (breast and female genital tract). Detection and characterization of breast neoplasia. Other breast lesions. Diagnosis, staging and monitoring of lesions of the female genital system. Congenital malformations.

15. Image-guided therapy: general interventionism. Use of Image-Guided Minimally Invasive Therapy. Treatment and monitoring of injuries.

16. Diagnostic imaging in diseases of the vascular system. Endovascular Image Guided Therapy. Historical evolution. Peripheral vascular interventional radiology. Interventional neuroradiology. Techniques and indications.

17. Diagnostic imaging in diseases of the spine and spinal cord. Conventional radiology: anatomy and semiology. CT and MR: indications. Spinal and cord injuries. Degenerative and inflammatory lesions of the spine.

18. Radiodiagnosis in diseases of the locomotor system. Main techniques used to detect and evaluate diseases of the joints and the bone.

19. Diagnostic imaging in pediatrics (I). Newborn and infant: differential features.

20. Diagnostic imaging in pediatrics (II). Toddler and older child: differential features.

21. Nuclear Medicine in Oncology: planar bone scintigraphy and SPECT. Detection of sentinel lymph node and radio guided surgery. Nuclear Medicine in Endocrinology: Thyroid and parathyroid pathology suprarenal glands. Neuroendocrine tumors.

22. PET/CT in Oncology. PET/MR and Micro-PET

23. Nuclear Cardiology: myocardial perfusion. Ventricular function. Sympathetic innervation. Necrosis and cardiac amyloidosis. Cardiovascular PET and devices infection.

24. Nuclear Medicine Therapy. Concept of Theragnosis. Hyperthyroidism and Thyroid Cancer. Bone metastases. Synoviorthesis. Neuroblastoma. Radioembolization. Radiolabeled peptide therapy.

Seminar practices

1. Basic anatomy and semiology in neuroradiology. Sectional anatomy: axial, sagittal and coronal studies. Brain hemispheres. Cerebellum and posterior fossa. Brain stem. Meninges and subarachnoid space. Ventricles and CSF circulation.

2. Radiodiagnosis in CNS and spine. Clinical cases: ischemic and hemorrhagic ictus, inflammatory and infectious diseases, neoplasm pathology.

3. Basic anatomy and semiology in thoracic radiology. Clinical cases, reading and differential diagnosis.

4. Radiodiagnosis in thorax diseases. Clinical cases, reading and differential diagnosis.

5. Radiodiagnosis in obstetrics-gynecologic diseases and breast diseases. Clinical cases, semiology and proper use of the image.

6. Basic anatomy and semiology in abdominal radiology. Clinical cases.

7. Basic anatomy and semiology in muscle-skeletal radiology. Radiodiagnosis in diseases of the spine. Use of the image in the degenerative and neoplasm diseases of the spine.

8. Radiodiagnosis in vascular diseases (diagnosis), percutaneous and endovascular treatment (neuroradiologic and general) in radiology.

9. Basic aspects in Nuclear Medicine (gammagraphy, SPECT, PET). Nuclear Medicine in digestive pathology: Salivary glands. Esophageal and gastric transit. Biliary pathology. Hemorrhages. Bile acid malabsorption. Intestinal infection. Splenosis. Nuclear Medicine in respiratory diseases: Pulmonary thromboembolism. Sarcoidosis. Pre-surgical pulmonary evaluation.

10. Nuclear Medicine in Nephro-urology: Renal scintigraphy. Renogram. Glomerular filtration. Renovascular hypertension. Kidney transplant. Nuclear Medicine in CNS: SPECT and PET. Demencia. Movement

diseases. Cerebro-vascular accident. Epilepsy. Brain tumours. Brain death. Amyloid plaque detection. Fistulas and derivations.

11. Nuclear Medicine in osteoarticular pathology: Benign bone pathology. Joint prosthesis. Metabolic, vascular, infectious, traumatic and sports pathology.

Clinical practices

RADIOLOGY. Structure and functions of a Radiology Department. Sessions of cases reading and identification of anatomical structures and main pathologies in radiodiagnosis.

NUCLEAR MEDICINE. Structure and functions of a Nuclear Medicine Department. Nuclear Medicine Techniques. Identification of anatomical structures and main pathologies in Nuclear Medicine.

WORKLOAD

PRESENCIAL ACTIVITIES

Activity	Hours
Theory	26,00
Seminars	26,00
Laboratory	0,00
In-class tutorials	0,00
Clinical practice	23,00
Total hours	**75,00**

NON PRESENCIAL ACTIVITIES

Activity	Hours
Attendance at other activities	0,00
Individual or group project	50,00
Independent study and work	0,00
Preparation of lessons	0,00
Preparation for assessment activities	25,00
Resolution of case studies	0,00
Preparation of supplementary reports	0,00
Preparation of the internship report and evaluation of the internship	0,00
Total hours	**75,00**

TEACHING METHODOLOGY

In **theoretical lessons** (master class), the teacher will introduce the most importante concepts and contents of the speciality. He/she will try to show the knowledge and the skills, the students must acquire. Students' participation will be encouraged by teachers. Teaching material could be available through the electronic resource "Aula Virtual".

Classroom practices (**seminars**). In small groups, teachers will introduce special topics in depth, cases study, bibliography handling and current topics... The group will work together and oral presentation of the assimilated knowledge will be encouraged. "Cooperative learning" is the goal of this activity.

Clinical practices: students' clinical practices will develope at University Hospitals, primary attention centers and mental health units to learn how to perform an anamnesis and basic clinical explorations.

The gender perspective, the respect for diversity, and the sustainable development goals (SDGs) will be incorporated into teaching, whenever possible.

EVALUATION

· Final multiple-choice exam with 100 multiple-choice questions (4 possible answers and only one correct answer). 50 questions will correspond to the theoretical part of the course. The other 50 questions correspond to the practical part and the seminars, including 10 questions with diagnostic images.

· For each wrong answer, 0.33 points will be deducted. Blank questions do not score points.

· The maximum mark for the exam will be 9 points.

· Attendance at a minimum of 80% of the clinical practices and seminars will be taken into account in order to obtain the remaining point which will be added to the mark obtained in the final exam provided that this mark is at least 4.5 points out of the total of 9 points in the final exam.

· The course may be passed regardless of the number of questions answered correctly in the theoretical or practical part.

· Attendance at practical activities is mandatory. The student is considered to meet this requirement if he or she has attended a minimum of 80% of these activities and has adequately justified the impossibility of attending the remaining sessions due to the occurrence of a cause of force majeure. It will be essential to comply with this requirement to pass the subject. If a student attends 80% of these activities and fails the final evaluation, he/she will be considered suitable for one more year. If he/she takes a third enrolment of the subject, he/she must attend 80% of the clinical practice and seminars again.

· It is a requirement for access to the advance of call of this subject that the student has completed the totality of their clinical practices and seminars.

Students are reminded of the importance of carrying out evaluation surveys on all the teaching staff of the degree subjects.

REFERENCES

- Del Cura, J.L.; Pedraza, S.; Gayete, A.; & Rovira, A. (Eds.). Radiología esencial. 2ª edición. 2018, SERAM, Editorial Médica Panamericana. - Herring, W. Learning radiology. Recognizing the basics. 4ª edición. 2020, Editorial Elsevier.

- García Vicente, Martín Comín y Soriano Castrejón. Medicina Nuclear en la práctica clínica, Aula Médica, tercera edición, 2019. - Biersack. Clinical Nuclear Medicine, Springer Verlag, 2007 - M. Minoves y E. Riera. Nuclear Medicine Imaging in bening bone and joint diseases, Masson, 2005 - E. Noriega y J. Martin-Comín. Atlas de inflamación e infección en Medicina Nuclear, Aula Médica, 2017 - Ziessman H, O¿Malley JP y Thrall, JH).Los requisitos en Medicina Nuclear, Elsevier 2007 - www.semnim.es/pages/formacion-casos-clinicos Recursos-e Salut: ClinicalKey Student. Elsevier (Scopus, ScienceDirect): uv-es.libguides.com/RecursosSalut/BibliotecaSalut

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