

**COURSE DATA****Data Subject**

<b>Code</b>	36317
<b>Name</b>	Cardiac image
<b>Cycle</b>	Grade
<b>ECTS Credits</b>	4.5
<b>Academic year</b>	2024 - 2025

**Study (s)**

<b>Degree</b>	<b>Center</b>	<b>Acad. year</b>	<b>Period</b>
1204 - Degree in Medicine	Faculty of Medicine and Odontology	4	First term

**Subject-matter**

<b>Degree</b>	<b>Subject-matter</b>	<b>Character</b>
1204 - Degree in Medicine	18 - Optional subjects	Optional

**Coordination**

<b>Name</b>	<b>Department</b>
BODI PERIS, VICENTE JOSE	260 - Medicine

**SUMMARY**

A global overview of the main invasive and non-invasive cardiac imaging techniques will be presented. Regarding each technique, a brief exposition of its technical foundations, an approach to the images in healthy patients, the contributions of the technique in the most prevalent cardiac pathologies and how to indicate their performance in an appropriate and individualized way to reach the correct diagnosis through a reasoned use of resources. The implications of each technique will be addressed in the prognostic evaluation, treatment and prevention of complications of the most frequent heart diseases.

Seminars will be held that will include the discussion of real clinical cases of patients studied with cardiac imaging techniques, the decision processes involved in choosing each technique.



## PREVIOUS KNOWLEDGE

### Relationship to other subjects of the same degree

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

### Other requirements

Aimed at students in the fourth and fifth year of the Medical Degree

### 1204 - Degree in Medicine

- Students must be able to apply their knowledge to their work or vocation in a professional manner and have acquired the competences required for the preparation and defence of arguments and for problem solving in their field of study.
- Students must have the ability to gather and interpret relevant data (usually in their field of study) to make judgements that take relevant social, scientific or ethical issues into consideration.
- Understand and recognise the effects, mechanisms and manifestations of diseases over the structure and function of the human body.
- Know how to use IT in clinical, therapeutic and preventive activities, and those of research.
- Organizar y planificar adecuadamente la carga de trabajo y el tiempo en las actividades profesionales.
- Capacidad para trabajar en equipo y para relacionarse con otras personas del mismo o distinto ámbito profesional.
- Criticism and self-criticism skills.
- Capacity for communicating with professional circles from other domains.
- Acknowledge diversity and multiculturality.
- Consideration of ethics as a fundamental value in the professional practise.
- Working capacity to function in an international context.

- Students will acquire an overall vision of the main techniques for heart imaging, both invasive and non-invasive. They will reach an approximation to imaging in healthy patients, the technical contributions in the most prevalent cardiac pathologies, and how to indicate their execution in a proper and individualised way, in order to reach the correct diagnosis through a rational use of resources. They will understand the implications of each technique in the prognostic evaluation will be addressed, as well as in the treatment and prevention of complications in the most frequent heart diseases.

- Students will be able to discuss real clinical cases of studied patients through heart imaging techniques, decision-making processes regarding the selection of techniques, differential diagnosis, prognostic stratification and the treatment of patients, highlighting the important role of anamnesis and physical examinations as first steps for an adequate selection of the most appropriate imaging technique. Students will also develop skills to do a presentation and discuss practical assignments related to heart imaging.



- Students will acquire the necessary skills for preparing several practical activities in this subject. They will be able to access bibliography and different websites regarding scientific societies constantly updated, in which students will revise lots of real clinical cases of heart imaging and their explanations. This will allow students make progress in an autonomous and steady way during knowledge acquisition of heart imaging techniques, both in the lessons and in the future. Also, it will help them do the practical work and prepare for their assessment.

## DESCRIPTION OF CONTENTS

### 1. THEORY

We will address the following issues during the on-site theoretical activities:

Doppler echocardiography  
Cardiac magnetic resonance  
Angio-CT  
Cardiac catheterization  
Nuclear cardiology

### 2. PRACTISE

Attendance at on-site practical activities will be mandatory. To pass the subject, the student enrolled for the first time must attend at least 80% of the on-site practical activities.

The following issues will be addressed during on-site practical activities:

Doppler echocardiography. Practical cases  
Cardiac magnetic resonance. Practical cases  
Angio-CT. Practical cases  
Cardiac catheterization. Practical cases  
Nuclear cardiology. Practical cases  
Discussion of online questionnaires  
Revision of images

**WORKLOAD**

ACTIVITY	Hours	% To be attended
Seminars	20,00	100
Theory classes	19,00	100
Clinical practice	6,00	100
Development of group work	4,00	0
Development of individual work	4,00	0
Study and independent work	25,00	0
Readings supplementary material	10,00	0
Preparation of evaluation activities	10,00	0
Preparing lectures	5,00	0
Preparation of practical classes and problem	5,00	0
Resolution of online questionnaires	4,50	0
<b>TOTAL</b>	<b>112,50</b>	

**TEACHING METHODOLOGY**

The teaching methodology is based on the development of three types of activities:

- **Theoretical activity** in which a global vision of the main invasive and non-invasive cardiac imaging techniques will be presented. Regarding each technique, a brief presentation of its technical foundations will be made, an approach to images in healthy patients, the contributions of the technique to the most prevalent cardiac pathologies and how to indicate its performance in an appropriate and individualized manner to arrive at the correct diagnosis through a reasoned use of resources. The implications of each technique in the prognostic evaluation, treatment and prevention of complications of the most common heart diseases will be addressed.

- **Practical activity** in which seminars will be held that will include the discussion of real clinical cases of patients studied with cardiac imaging techniques, the decision processes involved in choosing to perform each technique, the differential diagnosis, the prognostic stratification and the treatment of patients, highlighting the relevant role of history and physical examination as initial steps for an adequate choice of the most appropriate cardiac imaging technique. Clinical practices will be carried out in the form of discussion of clinical cases in the classroom itself.

- **Non-face-to-face activity** Preparation of theoretical and practical activities, practical work (individually or in groups) and practical and final evaluation. Appropriate bibliography and different websites of constantly updated scientific societies will be provided where students will be able to review a multitude of real clinical cases of reasoned cardiac imaging. This will allow them to advance autonomously and continue in their knowledge of cardiac imaging techniques both during teaching and in the future, it will help them to carry out practical work and prepare for the evaluation.



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

## EVALUATION

### - EVALUATION OF THE FIRST CALL:

- Theoretical evaluation: 50% of the final grade. Maximum score to obtain from this section: 50 points. The exam is the same for all students in the subject. A test will be carried out with 25 multiple choice questions based on the general contents taught in both the theoretical activities and the practical in-person and non-face-to-face activities. There will be 4 possible answers to each question. Each correct answer is worth 2 points. Wrong or blank answers do not count.

- Practical evaluation: 50% of the final grade. It will consist of 3 sections:

- 1) Practical examination of cardiac imaging cases. 10% of the final grade. Maximum score that can be obtained from this section: 10 points. Each student will be presented with 1 characteristic real case of cardiac imaging that the student must comment on orally. For this exam, the group will be divided into 2 subgroups, which will take the exam in 2 simultaneous sessions (each session lasting 1 hour during which students must remain in the classroom). The teacher will briefly discuss the case presented with each student.
- 2) Preparation of a practical work individually or in a group (up to 3 students) focused on the cardiac imaging techniques addressed during teaching. 10% of the final grade. Maximum score that can be obtained from this section: 10 points. It may be a clinical case or a review on the value of one or more cardiac imaging techniques in the diagnosis and management of a specific pathology. The written report will be delivered through the virtual classroom no later than the day before the practical examination of cardiac imaging cases is carried out. As a guide, the written report will be 10 pages, single-sided, double-spaced, and will include a title, summary, introduction, development of the work, conclusions, bibliography and figures. Students who wish may present their work orally in addition to submitting the written report, which will be taken into account in the final evaluation. Only students who make the oral presentation will be able to obtain the maximum score (10 points, 10% of the final grade) in this section.
- 3) Participation and results obtained in the different continuous evaluation activities. 30% of the final grade. Maximum score that can be obtained from this section: 30 points. At the end of each teaching week, students will be asked a questionnaire with 5 multiple response questions in relation to the material taught throughout the week. Each question will have 4 possible answers, wrong or blank answers do not count. The questionnaires will be carried out in person. The marks obtained in the questionnaires will be added throughout the course and the maximum score that can be obtained is 30 points (30% of the final grade).



Students who do not complete at least 80% of the continuing education questionnaires for justified reasons, if they request it, will be given an oral evaluation instead, which will result in the total grade for this section.

- Requirements to pass the subject:

It is not necessary to pass the theoretical and practical evaluation separately.

It is not necessary to pass each of the listed sections separately to pass the subject.

The requirement to pass the subject is to obtain a total (sum of all sections) of at least 50 points.

To pass the subject, students enrolled for the first time must attend at least 80% of the practical in-person activities.

- **EVALUATION OF THE SECOND CALL:**

-The grade obtained in the first call in the practical evaluation (50% of the total) will be maintained for the second call.

-The theoretical evaluation of the second call will account for 50% of the grade in said call and will have the same characteristics as the first call.

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.

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

## REFERENCES

### Basic

- Bodí Peris V, Chorro Gascó FJ (eds): Imagen cardiaca. Valencia. Universidad de Valencia, 2015.
- Chorro Gascó FJ (ed.): Ecocardiografía-Doppler. Valencia, Universidad de Valencia, 2011.
- Recursos-e Salut: ClinicalKey Student. Elsevier (Scopus, ScienceDirect):  
[uv-es.libguides.com/RecursosSalut/BibliotecaSalut](http://uv-es.libguides.com/RecursosSalut/BibliotecaSalut)

### Additional

- Chorro Gascó FJ, García Civera R y López Merino V (eds.): Cardiología Clínica. Valencia, Universidad de Valencia, 2007.
- Mann DL, Zipes DP, Libby P, Bonow RO (eds): Braunwalds Heart Disease. A Textbook of Cardiovascular Medicine. Elsevier, 10ª edición, 2015.



Foro de técnicas de imagen

<http://www.secardiologia.es>

<http://www.ecocardio.com/index.asp>

Foro de casos de ecocardiografía

<http://www.ecosiac.org/casos.php>

Foro de casos de resonancia magnética cardíaca

<http://www.scmr.org/navigation/CMR-in-specific-circumstances.html>

<http://www.scmr.org/caseoftheweek.html>

Foro de casos cateterismo cardíaco

<http://www.pcronline.com/Clinical-cases>

Foro de cardiología nuclear

<https://www.asnc.org/content.asp?admin=Y&contentid=353>

<https://humanhealth.iaea.org/HHW/NuclearMedicine/CardiovascularandPulmonary/TeachingCases/index.html>

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