



Universitat de Lleida

DEGREE CURRICULUM  
**IMAGE DIAGNOSIS**

Coordination: LOPEZ HELGUERA, IRENE

Academic year 2022-23

Subject's general information

<b>Subject name</b>	IMAGE DIAGNOSIS				
<b>Code</b>	100359				
<b>Semester</b>	1st Q(SEMESTER) CONTINUED EVALUATION				
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>	
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	4	COMPULSORY	Attendance- based	
<b>Course number of credits (ECTS)</b>	6				
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRACLIN	PRALAB	PRAULA	TEORIA
	<b>Number of credits</b>	1	1.4	0.6	3
	<b>Number of groups</b>	6	4	2	1
<b>Coordination</b>	LOPEZ HELGUERA, IRENE				
<b>Department</b>	ANIMAL SCIENCE				
<b>Teaching load distribution between lectures and independent student work</b>	60 contact hours 90 non-contact hours				
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.				
<b>Language</b>	Spanish Catalan English				

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BASSOLS WOLF, MARTA	marta.bassols@udl.cat	4,6	
LOPEZ HELGUERA, IRENE	irene.lopez@udl.cat	2,5	
MOLIN MOLINA, JESSICA	jessica.molin@udl.cat	3,8	
MORERA CELDA, NEUS	neus.morera@udl.cat	1,4	
ROSSELLO VALLES, JOAN PERE	joan.rossello@udl.cat	,3	
SANCHEZ SALGUERO, XAVIER	xavier.sanchez@udl.cat	3,2	

## Learning objectives

-Know the production and properties of ionizing radiation. Know the risks associated with its use and the necessary protection regulations.

-Acquire the theoretical and practical knowledge necessary for radiodiagnosis in veterinary medicine.

-To acquire the theoretical and practical knowledge necessary to apply ultrasound in the veterinary clinic.

-Know the advanced imaging techniques, mainly CT (Computed Tomography) and MRI (Magnetic Resonance), but also scintigraphy and laparoscopy.

-Know how to choose the appropriate diagnostic method in each case

-Use the appropriate nomenclature for each diagnostic technique

-Know how to interpret the results generated in each of the different diagnostic techniques.

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different diagnostic techniques.

## Competences

### BASIC COMPETENCES

CB1, CB2, CB3, CB4, CB5

### TRANSVERSAL COMPETENCES

CT1, CT2, CT3, CT4, CT5

### GENERAL COMPETENCES

CG2 The prevention, diagnosis and individual or collective treatment, as well as the fight against animal diseases, whether they are considered individually or in groups, particularly zoonoses.

CG5 Knowledge and application of legal, regulatory and administrative provisions in all areas of the veterinary profession and public health, understanding the ethical implications of health in a changing global context.

CG6 Development of professional practice with respect to other health professionals, acquiring skills related to teamwork, the efficient use of resources and quality management.

CG7 Identification of emerging risks in all areas of the veterinary profession

### SPECIFIC COMPETENCES

CE14. Identify and apply the methods and procedures of clinical examination, complementary diagnostic techniques and their interpretation, as well as identify and apply the fundamentals of autopsy.

CE15 Identify and apply diagnostic imaging and radiobiology

CE16. Identify and apply the recognition and diagnosis of the different types of injuries and their association with pathological processes

CE22. Know the infectious and parasitic diseases of veterinary interest including their diagnosis and fight as well as apply the bases of Zoonosis and Public Health

CE40. Perform basic analytical techniques and interpret their clinical, biological and chemical results, interpret the results of tests generated by other laboratories as well as collect, preserve and send all types of samples with their corresponding report.

CE42. Use radiographic and ultrasonographic equipment, as well as other equipment that can be used as diagnostic means, safely and in accordance with regulations

## Subject contents

### THEORETICAL PROGRAM:

1. Basic principles of the main diagnostic techniques used in the veterinary clinic.

2. Thoracic cavity and the different imaging tests.
3. Abdominal cavity and the different imaging tests.
4. Extremities and the different image tests.
5. Diagnostic imaging in exotic animals.
6. Imaging techniques in large animals.
7. Neuroanatomy and image diagnosis of the CNS.

## PRACTICAL PROGRAM:

- Positioning the patient to perform the imaging tests.
- Diagnostic imaging of different pathologies of the thoracic cavity.
- Ultrasound of the abdominal cavity.
- Computed axial tomography.
- Diagnostic imaging of different limb pathologies.
- Imaging tests on different exotic animals
- Magnetic resonance. I
- imaging diagnosis in the equine clinic.
- Per-image diagnosis of different pathologies of the abdominal cavity.
- Neuro: axial skeleton image.
- Neuro: brain dissection.
- Neuro: CT / MRI image of the CNS.
- CT / MRI Cases
- Presentation of clinical cases.
- Description and interpretation of the different images resulting from different tests available in the veterinary clinic.

## Methodology

The teaching activity is structured in theory and practice sessions.

- Theoretical classes: they are based on master class sessions that aim to transmit the basic knowledge of each subject.
- Practices: they are based on seminar sessions, clinical cases and practical application of theoretical knowledge.

The didactic material of the subject will be shared as a resource on the virtual campus.

## REGULATION OF THE SUBJECT

N1. No changes of groups or practices are allowed except for those justified by an official medical certificate or the exchange of participants.

N.2 It is required to wear surgical pajamas and / or a gown to access the practices that are carried out in operating rooms, consultations or in the radiodiagnosis service of the Unitat Quirúrgica Docent de Torrelameu. Failure to meet this requirement, the student will not be able to access the practice.

N3. Punctuality is required in the theoretical and practical sessions. A session will not be accessible if after 10 minutes from the start.

N4. If it is detected that a student copies in an exam, the immediate expulsion will be carried out and the responsible person will have to recover the entire subject.

All activities will be in person if sanitary conditions allow it. Otherwise, the sessions will be done virtually.

## Development plan

The theoretical classes will establish the basic knowledge of the fundamentals and execution of the main image diagnosis techniques used in Veterinary Clinic, as well as the reading of real images obtained through these different techniques. The lectures will be based mostly on PowerPoint projections.

The seminars will reinforce the theoretical aspects, as well as the attitudes and practices necessary for personal safety, that of the animal and that of the team. There will be some sessions devoted to anatomy of limbs, eye and its annexa, hearing and equilibrium senses, and neurological evaluation. The practical training and seminars will be held in small groups of students in the dissection room, 50' per group.

For practical training, students must come conveniently equipped with personal protective equipment (vinyl gloves, white robe and waterproof boots) and fine dissection material (forceps and scalpel). Students will not be allowed entry into the room if they do not have this minimum equipment.

## Evaluation

### Theory (70%)

The theory will be evaluated from two partial exams. First exam will be the 40% of the final mark and the second exam the 30%

- First partial exam: it will consist of a test part (50%) and a written part (50%). It is necessary to get a minimum of 4 in each part in order to make an average.
- Second partial exam: it will be a test type exam.

A minimum of 5 is required in each part to be able to do the average with the rest of the grades and thus be able to pass the course.

At the end of the semester there will be a recovery exam in which the student who has failed a part, may appear to recover it. In case of failing both partials, the student must sit both recovery exams.

Students who do not reach 5 in the theoretical exams, their final grade will be the weighted average of both partials, not counting the marks of the practical activities.

When the final mark is above 7 points (exams + practical activities), it can be reward to guarantee the excellent marks if it is deemed appropriate based on the student's evolution during the semester.

### Practice (15%)

Some practices of the subject will be evaluated through a test through the virtual campus. The average of these tests will configure the practical grade for the course, which will represent 15% of the final grade for the course.

### Clinical case (15%)

Students, in small groups, will make an oral presentation of a clinical case of diagnostic imaging. The grade will be

the same for all group members and will represent 15% of the final grade for the course.

According to the udl and school regulations, it is completely forbidden to copy in the exams, as well as not to respect the previously established rules of the test (mobile devices, digital watches, etc.). In the event that a student does not comply with this rule, he will be expelled from the exam immediately and will not have the right to appear in the partials, having to go to the recovery of both partials.

## Bibliography

- BARR, F. J.; KIRBERGEN, R.M. BSAVA Manual of Canine and Feline Musculoskeletal Imaging. British Small Animal Veterinary Association. Gloucester 2006.
- BURK, R.L.; FEENEY, D.H. Small Animal Radiology and Ultrasonography. A Diagnostic Atlas and Text, W. B. Saunders Company. Philadelphia. 2003.
- BUTLER, J.A.; COLLES, Ch. M.; DYSON, S. J.; KOLD, S. E.; POULOS, P. W.; Clinical Radiology of the Horse, 3<sup>a</sup> edition, Blackwell Science. Oxford. 2008.
- KEALY, J.K.; MCALLISTER, H.; GRAHAM, J.P. Diagnostic Radiology and Ultrasonography of the Dog and Cat. 5<sup>o</sup> edición. 2011
- KÖNIG, H.E.; LIEBICH, H.G. Anatomía de los animales domésticos. Tomo I y II. 2<sup>a</sup> edición. Editorial Médica Panamericana. Madrid 2005.
- NYLAND. T.G.; MATTOON, J.S. Diagnóstico Ecográfico en Pequeños Animales. 2<sup>a</sup> Ed. Multiméica. Barcelona. 2004.
- O'BRIEN, R.; BARR, F.J. BSAVA Manual of Canine and Feline Abdominal Imaging.
- PENNINCK, D.; D'ANJOU, M.A. Atlas de ecografía en pequeños animales. Multiméica. Sant Cugat del Vallés. Barcelona. 2010.
- SCHWARTZ, T.; SAUNDERS, J. Veterinary Computed Tomography. Wiley-Blackwell Publishing. Oxford. 2011.
- THRALL, D.E. Textbook of Veterinary Diagnostic Radiology. 6th Ed. W.B. Saunders Company. Philadelphia. 2013.
- WEAVER, M.; BARAKZAI, S. Handbook of Equine Radiography. Saunders Elsevier. 2010.
- Pàgines web:
- American College of Veterinary Radiology ([www.acvr.org](http://www.acvr.org))
  - European Association of Veterinary Diagnostic Imaging ([www.eavdi.org](http://www.eavdi.org))
  - Veterinary Radiology ([veterinaryradiology.net](http://veterinaryradiology.net))