28422 - Image Diagnosis

Syllabus Information

Academic Year: 2019/20
Subject: 28422 - Image Diagnosis
Faculty / School: 105 - Facultad de Veterinaria
Degree: 451 - Degree in Veterinary Science
ECTS: 6.0
Year: 3
Semester: Annual
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

The general goal of the course is to make undergraduate student, once passed the course, get the theoretical and practical knowledge of diagnostic imaging techniques useful in the veterinary field, to later be able to use them in the development of their profession.

The general aims of this course are to:

1. Know the nature and properties of ionising radiation and, in particular, X-rays.
2. Become aware of the harmful effects of ionising radiation.
3. Know the forms of protection based on the principles of justification (any exposure to radiation should lead to a benefit in return), optimisation (seeking minimum risk and maximum benefit) and limitation (not exceeding maximum dose levels).
4. Know the diagnostic applications of ionising radiations through knowledge of the equipment used in veterinary medicine and the most usual techniques, fundamental for good radiological protection.
5. Know the radiological positions and projections of the animal in each species and anatomical region.
6. Know the main radiological contrast media and their main application.
7. Know radiological semiology and to establish the bases for the diagnostic interpretation of radiological images.
8. Know the fundamentals of ultrasound and its usefulness in small and large animals.
9. Know the indications, the diagnostic power and the limitations of ultrasound.
10. Manage the appropriate terminology and know how to interpret an ultrasound report.
11. Know the fundamentals of endoscopy, flexible and rigid, indications and their diagnostic and therapeutic usefulness in small and large animals.
12. Know the fundamentals of thermography, indications and diagnostic usefulness in animals and facilities for their breeding.
13. Know the theoretical bases and indications of computed tomography, magnetic resonance and nuclear medicine, as well as new diagnostic imaging techniques and their applications in veterinary sciences

1.2.Context and importance of this course in the degree

Image diagnosis represents a basic subject to carry out the integrations by species, necessary to carry out the clinical diagnosis with guarantee, and also to value certain productive aspects and of animal welfare of our cattle species. For this reason, it is located in the third year, before the student approaches the study of integrations by species and practicum.

1.3.Recommendations to take this course

In order to take this subject, it is particularly necessary that students have passed the subjects of Basic Sciences, Anatomy and Embryology I and II.

2.Learning goals

2.1.Competences

On successful completion of this course, students will be able to:

1. Identify and differentiate the different image media useful in Veterinary Sciences.
2. Use the different means of diagnosis by image in Veterinary, knowing their applications, indications and limitations in the different species and anatomical regions.
3. Use ionising radiation rationally as a means of diagnosis in Veterinary Medicine, to assess its possible risks and to apply the necessary radioprotection measures for its clinical use.
4. Correct management radiological semiology, to correctly interpret radiological and ultrasound anatomy and to be able to Identify pathological patterns in radiology and ultrasound in the different species and regions, and to associate them with the most frequent pathologies.
5. Perform a quality diagnostic radiography, obtaining the most common projections by means of the correct positioning of the animals and to perform a basic ultrasound scan knowing how to locate the main organs.

2.2.Learning goals

If students complete the course successfully, they should be able to

1. Get to know the technical bases and fundamentals of the image techniques commonly used in the different animal species of veterinary interest.
2. Know the indications of the imaging techniques commonly used in the different animal species of veterinary interest.
3. Know the language and terms used in the different systems of image diagnosis.
4. Know the mechanisms of interaction of X-rays with matter and radioprotection measures.
5. Know how to interpret normal patterns in different imaging techniques.
6. Recognize and knows how to diagnose the main types of pathological patterns and lesions observed in the use of different imaging techniques.
7. Perform a quality radiography in a practical manner, using ultrasound equipment and knowing the basics for performing an endoscopy.

2.3.Importance of learning goals

Once the course has been passed, the student will be able to use and interpret different techniques that will allow him/her to obtain information to complete the diagnoses, evaluate the patient's condition with a view to making prognoses, follow the response to treatments, and in livestock species to evaluate reproductive and productive aspects.

3.Assessment (1st and 2nd call)

3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

Assessment activities

The student must demonstrate that has achieved the intended learning outcomes through the following assessment activities

1. For the subject assessment the student will have to pass a theoretical exam and a practical one. The theoretical examination assesses whether the student has acquired the knowledge referred to in learning outcomes 1, 2, 3, 4, 5 and 6, and the practical examination assesses results 3, 4 and 7.
2. The theoretical examination will be carried out in writing, and will consist of answering short answer questions or multiple-choice or true/false questions(reasoned); many of the questions will be about images.
3. The practical examination will consist of answering in written form the questions of a practical nature on the clinical use of the different imaging media, always being based on the activities of the practical programme. In order to take this exam, the student must have attended the practical sessions. In cases in which the student has not attended all the practical sessions, an oral examination of a practical nature will be carried out.

Valuation criteria and requirement levels

In order to pass the examination, whether theoretical or practical, the student must obtain at least 50 % of the total score. Once both exams have been passed, for the overall evaluation of the subject, the score of the practical exam will be 25% of the final grade of the subject, and that of the theoretician 75%. In case of passing one of the exams, theoretical or practical, will be saved between sessions.

Marking system:

According to the national regulation Law 1025/2003, 5th of September which lays down the European system of credits and marking system for the university degree.

0-4,9: FAIL.

5,0-6,9: PASS

7,0-8,9: GOOD (NT).

9,0-10: EXCELLENT (SB).

As the article 158 of the Statutes of the University of Zaragoza lays down, provisional grades will be displayed at least for 7 days and students will be able to review them on the date, time and place provided for that purpose.

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

The learning process designed for this subject is based on the following:

The learning process consists in a theoretical part and practical part. The theoretical part consists of a total of 42 hours and for its teaching in class, basic and advanced resources will be used, from the most basic and universal support as blackboard and chalk to more advanced resources as multimedia systems and network connection to access to imaging databases.

The practical sessions will be held with a total of 18 hours, and with them the student will practice the most common techniques used in diagnostic imaging veterinary: ultrasound, radiology and endoscopy, focusing mainly on methodological aspects, safety and interpretation of patterns.

4.2.Learning tasks

The teaching of this subject will be taught according to the following activities:

- 42 Theoretical classes of 50 minutes.
- 9 Practices in small groups, ranging between 1 and 2 hours.
- 3 Voluntary Seminars, 1 hour.

In addition, there will be e-learning support with Moodle2, in which teachers, voluntarily, may include summaries of their lectures or practical seminars, additional content, web pages, etc.

4.3.Syllabus

The program that the student is offered to achieve the expected results includes the following activities

THEORETICAL PROGRAM:

GENERAL MODULE

Unit 1. Fundamentals of Radiology (2 h)

Unit 2. Fundamentals of Ultrasound (2 h)

Unit 3. Other imaging means: CT, MRI, nuclear medicine. Fundamentals and diagnostic applications (2 h)

Unit 4. Basics of endoscopy (1 h)

MODULE SMALL ANIMALS

Unit 5. Thorax 1: Anatomy applied to imaging in thoracic cavity (1 h)

Unit 6. Chest 2: Chest Radiology (4 h)

Unit 7. Thorax 3: Echocardiography (2 h)

Unit 8. Abdomen 1: Radiological anatomy and radiology of the abdomen (4 h)

Unit 9. Abdomen 2: Ultrasonographic anatomy and abdominal ultrasound (4 h)

Unit 10. Anatomy applied to the imaging of the head and neck. Radiology of the head and neck (2 h)

Unit 11. Anatomy applied to column imaging. Radiology of the column (2 h)

Unit 12. Anatomy applied to extremities imaging. Radiology of the limbs (2 h) MODULE HORSES

Unit 13. Diagnostic imaging of the head (1 h)

Unit 14. Diagnostic imaging of the neck and axial region (1 h)

Unit 15. Diagnostic imaging of the chest. Upper respiratory tract, lungs and lower airways. (2 h)

Unit 16. Diagnostic imaging of the abdomen 1: gastrointestinal and urinary tract (1 h)

Unit 17. Diagnostic imaging of the abdomen 1: reproductive system (1 h)

Unit 18. Diagnostic imaging of the limb 1: finger (hoof and pastern) (1 h)

Unit 19. Diagnostic imaging of the limb 2: fetlock joint and cannon (metacarpus and metatarsus) (1 h)

Unit 20. Diagnostic imaging of the limb 3: proximal regions of the forelimb (carpus, forearm, elbow, upper arm, elbow, shoulder) (1 h)

Unit 21. Diagnostic imaging of the limb 4: proximal regions of the hindlimb (hock, gaskin, stifle, thigh, hip) (1 h)

MODULE OTHER SPECIES

Unit 22: Diagnostic Imaging in exotic species (1 h)

Unit 23: Diagnostic Imaging in livestock species (2 h)

PRACTICAL PROGRAM:

PRACTICE 1. General Ultrasound: Ultrasound types, basic technique, artifacts. (2 hours)

PRACTICE 2. General Radiology: Quality Control (detail, contrast), appliances, security. (1 hour 30 min)

PRACTICE 3. Abdominal ultrasound of small animals: protocoled abdominal ultrasound scan, normal patterns. (2 hours)
PRACTICE 4. Small Animal Radiology: positioning, handling and exposure parameters. (2 hours)

PRACTICE 5. Echocardiography: Technique, access windows, normal patterns. (1 hour)

PRACTICE 6. Radiology in horses: quality control (detail, contrast), appliances, security, management, positioning. (2 hours 30 min)

PRACTICE 7. Ultrasound horse's techniques, access windows, normal patterns. (2 hours 30 min) PRACTICE 8. Endoscopy basic techniques, management and description of equipment (1 hour) PRACTICE 9. Diagnostic imaging in livestock animals. (2 hours)

3: VOLUNTARY SEMINARS

SEMINAR 1. Echocardiography and augmented reality (1 hour)

SEMINAR 2. Use of CT for surgical planning (1 hour)

SEMINAR 1. Clinical imaging cases in horses (1 hour)

4.4.Course planning and calendar

https://veterinaria.unizar.es/horarios1vet

4.5.Bibliography and recommended resources

http://psfunizar7.unizar.es/br13/egAsignaturas.php?codigo=28422