Course Specifications
Valid as from the academic year 2019-2020

Medical Imaging and Radioprotection (G000736)

Course size (nominal values; actual values may depend on programme)

Credits 4.0  Study time 120 h  Contact hrs 45.0 h

Course offerings and teaching methods in academic year 2019-2020

A (semester 2)  Dutch  clinical lectures 10.0 h
lecture 35.0 h

Lecturers in academic year 2019-2020

Bergman, Hendrik  DI11  staff member
Van Caelenberg, Annemie  DI11  staff member
Saunders, Jimmy  DI11  lecturer-in-charge
Vanderperren, Katrien  DI11  co-lecturer
Van Ryssen, Bernadette  DI09  co-lecturer

Offered in the following programmes in 2019-2020

Bachelor of Science in Veterinary Medicine  4  A

Teaching languages

Dutch

Keywords

Abdomen - Artificial intelligence - Domestic animals - Medical imaging - Musculoskeletal - Radiographic anatomy - Thorax

Position of the course

This course is made up of 5 parts: (1) Abdominal imaging, (2) imaging of the head and axial skeleton (neuroradiology), (3) Orthopedic imaging, (4) thoracic imaging, (5) artificial intelligence (AI). The parts 1 to 4 closely follow the base courses morphology and in a lesser degree physiology, in which the anatomy and the functioning of the animal are described, and the clinical/pathological imaging of a sick animal. Part 5 provides a basic knowledge of the use of artificial intelligence for image interpretation. It connects to physics (medical apparatus and radioprotection). The objective of this course is to teach (1) the radiographic nomenclature including the standard projections, (2) the anatomical variations, (3) the general principles of interpretation of radiographs, (4) the radiographic signs of the major musculo-skeletal, thoracic and abdominal disorders of companion animals, (5) the future use of AI in medical imaging. This course provides the basis for the second master courses that teach more detailed and complicated orthopedic, thoracic and abdominal disorders.

Contents

For each part 1 to 4 (1) the standard radiographic projections are described, (2) the radiographic anatomy (of the head, thorax, abdomen and the axial and appendicular skeleton of companion animals, and of the appendicular skeleton of horses) is discussed, (3) the anatomical variations and the factors that can be of influence on the quality of the images, with special attention to clinically relevant structures are discussed, (4) the general principles of interpretation of radiography, and (5) the radiographic signs of the most common disorders are discussed in detail. Clinical lectures will be taught in the auditorium, where students will be confronted with clinical problems they have to solve and learning paths will be provided support teaching. The use of artificial intelligence (AI) for image interpretation will be discussed.

Initial competences

A deep knowledge of the topographic and clinical anatomy part I and II from the second bachelor is mandatory.

(Proposal)
The students need to possess a good knowledge of the radiographic anatomy and anatomical variations in small and large animals.

Final competences
1. To be able to recognize the standard radiographic projections and to use their correct name.
2. To know the clinically relevant radiographic of companion animals.
3. To recognise the anatomical variations (=clinically irrelevant variations) on the images of small and large companion animals.
4. To apply the general principles of interpretation of radiography of the locomotory systems in clinical circumstances and to recognise the main musculoskeletal disorders of companion animals on radiographic images.
5. To apply the basic principles for interpretation of thoracic and abdominal radiographs in small animals in clinical circumstances and to recognise the main disorders of thorax and abdomen on radiographic images.
6. To recognize the main disorders of the feet, fetlock and tarsus in horses on radiography as well as the main musculoskeletal disorders of large animals.
7. To recognize the main disorders of new companion animals (bird, rabbit, rat, tortoise, guinea pig, ...) on radiography.
8. To realise the importance of interdisciplinarity.
9. To judge a clinical situation from different perspectives (multiperspectivism).
10. To realise the plusvalue of international and intercultural competences.
11. To realise the importance of continued education.
12. To be able to apply the basic principles of radiography in light of the public health.
13. To be aware of the future possibilities of artificial intelligence for the interpretation of imaging studies.

Conditions for credit contract
Access to this course unit via a credit contract is determined after successful competences assessment.

Conditions for exam contract
This course unit cannot be taken via an exam contract.

Teaching methods
Guided self-study, lecture, clinical lectures.

Extra information on the teaching methods
Lectures are the primary teaching method. During the clinical lectures, clinical cases are discussed and analysed to show the importance of anatomy in medical imaging. An active participation of the students is expected. An electronic voting system is used during these demonstrations. Learning paths are used for teaching of orthopedic imaging en artificial intelligence.

Learning materials and price
The course material includes handouts, a syllabus (for a part of the course) and images discussed during the lectures. The handouts and pictures are available on Minerva. Sample questions are also available on Minerva.

References

Course content-related study coaching
The teacher can be approached by the students at the end of a lecture, during the clinical activities or on appointment by e-mail. Books are suggested as a support to the lectures but are not part of the study/exam material.

Evaluation methods
End-of-term evaluation.

Examination methods in case of periodic evaluation during the first examination period
Written examination with multiple choice questions.

Examination methods in case of periodic evaluation during the second examination period
Written examination with multiple choice questions.

Examination methods in case of permanent evaluation

Possibilities of retake in case of permanent evaluation
Not applicable.

Extra information on the examination methods

(Proposal)
The study material consists of the content of the learning paths and everything that was discussed during the lectures and clinical sessions. The examination includes 40 multiple choice questions with 3 possible answers (1 is correct). The students will be informed about the exam.

Calculation of the examination mark

The final score will be provided based on standard settings. The settings will be defined in accordance with the OER.
Forty correct answers are needed to obtain a score of 10/20.