NORMAL VETERINARY RADIOGRAPHIC AND TOMOGRAPHIC ANATOMY
(4 CFU; 48 hours: 36 of lessons e 12 of practical training)

Learning goals : the students will be able for a correct interpretation of the radiographic, ultrasonographic and tomographic normal study of the thorax, abdomen and the skeletal system of the domestic animals

Theoretical training

Topics and acquired competences	Topics	Specific contents	hours
1. BASICS OF RADIOGRAPHIC AND TOMOGRAPHIC TECHNIQUE: PHYSICAL PRINCIPLES, RECORDING SYSTEMS, IMAGE FORMATION, PROJECTIONS (TOT.6 HOURS) ***knowledge*** ***a)*** physical basics of diagnostic X-ray ***b)*** radiographic image formation ***c)*** radiographic findings ***d)*** types of projections for use in different body parts	**Physics of Diagnostic Radiology**	X-rays production, interaction of radiation with matter, quantity and quality of the X-rays beam, absorption	2
	Recording the X-ray image	X-ray film and intensifying screens	1
	Image formation	Phisical, technical and optical-geometrical factors, scale of opacity	2
	Projections	Nomenclature of radiographic viewing commonly used in different body parts	1
2. X-RAY EXAMINATION OF THE NECK AND CHEST REGION (TOT. 8 HOURS) ***knowledge*** ***a)*** technical procedures of the chest radiography; ***b)*** principles of radiographic interpretation of the neck and chest normal anatomical structures in different animals and in canine polymorphism.	**Chest radiography technique**	Patient positioning and radiographic projections, exposure factors.	1
	Small animals larynx and pharynx region	Pharynx, larynx	1
	Upper and lower airways	Trachea, tracheal carina , bronchial tree	1
	Small animal lung	Lung lobes and their thoracic location, pulmonary interstitium, alveolar space	1
	Mediastinum	Lymph Nodes, cranial and caudal mediastinal structures	1
	Diaphragm and thoracic structures in small animal	Diaphragm and thoracic structures in small animals	1
	Radiographic examination of the small animal cardiovascular system	Heart, major vessels, pulmonary vasculature	1
	Radiographic examination of the equine thorax	Radiographic technique, four standard views and normal structures examination	1

3.* X-RAY EXAMINATION OF THE ABDOMEN (TOT. 5 HOURS)** ***knowledge ***a)*** technical procedures of the abdomen radiography; ***b)*** principles of radiographic interpretation of the normal abdominal structures	**Small animal abdominal radiographic technique**	Patient positioning and radiographic projections, exposure factors.	1
	Gastrointestinal tract	Normal radiographic anatomy of the esophagus, stomach, small and large bowel, gastrointestinal contrast studies	2
	Liver, spleen and pancreas	Liver, spleen and pancreas	1/2
	Urinary tract	Normal radiographic anatomy of the kidneys, ureters and bladder, principles of contrast studies	1 e 1/2
4.* X-RAY EXAMINATION OF THE SKELETON *(TOT.7 HOURS) ***knowledge*** ***a)*** technical procedures of the abdomen radiography ***b)*** principles of radiographic interpretation of the skeleton in different animals, ages and in canine polymorphism.	**Radiographic technique of the skeleton**	Patient positioning and radiographic projections, exposure factors in different body parts	1
	Small animal axial skeleton	Skull and spine	2
	Small animal appendicular skeleton	Forelimb and Hind limb	4
	Equine appendicular skeleton	Distal part of the appendicular skeleton	1
5.* PRINCIPLES OF ULTRASONOGRAPHIC TECHNOLOGY: IMAGE FORMATION. PRINCIPLES OF INTERPRETATION AND ARTIFACTS (TOT. 5 ORE)** ***knowledge ***a)*** physics of medical sonography ***b)*** image interpretation (echogenicity and echotexture) of the structures. ***c)*** main sonographic artifacts	**Physics of ultrasound imaging**	Echoes generation, image formation, modes of echo display	2
	Sonographic interpretation	Terminology of ultrasound images (echogenicity and echotexture), ultrasound scanning techniques	1
	Artifacts	Shadowing, enhancement, reverberation, mirror image	1
	Instruments	Transducers, instrument controls	1

d) use of transducers in different anatomic structures			
6. **ABDOMINAL ULTRASOUND (TOT.5 HOURS)** ***knowledge*** ***a)*** ultrasonographic technique, patient positioning and transducer placement. ***b)*** ultrasonographic features of each abdominal organ	**Gastrointestinal tract**	Stomach, small and large bowel	2
	Urinary tract	kidneys, ureters and bladder	1
	Spleen and Lymph Nodes	Spleen and Lymph Nodes	1
	Liver and pancreas	Liver and pancreas	1

Supervised practical training			
Topics and acquired competences	**Topics**	**Specific contents**	**hours**
6. X-RAYS STUDIES INTERPRETATION OF (TOT. 10 HOURS REPEATED FOR 4 GROUPS) ***knowledge*** a) radiographic interpretation of normal structures of the body	**Chest**	Each Student receives an evaluation sheet to fill out for: a) judge the quality of radiography b) identify the projection c) detect the different anatomic structures	4
	Abdomen	Each Student receives an evaluation sheet to fill out for: a) judge the quality of radiography b) identify the projection c) detect the different anatomic structures	2
	Skeleton	Each Student receives an evaluation sheet to fill out for: a) judge the quality of radiography b) identify the projection c) detect the different anatomic structures	4
7. LIVE DEMO OF ABDOMINAL ULTRASOUND WITH SPECIFIC REFERENCE TO PRACTICAL AND TECHNICAL ASPECTS OF DISPLAY ABDOMINAL ORGANS (TOT. 2 HOURS REPEATED FOR 4 GROUPS) ***knowledge*** ***a)*** identification of normal abdominal structures and their ultrasound features.	**Abdominal organs**		3