UNIVERSITY OF TERAMO

FACULTY OF VETERINARY MEDICINE

EAEVE VISIT

8-12 OCTOBER 2007

ANNEXES

ANNEXES

TABLE OF CONTENTS

ANNEX 4.1
CLASS OF SPECIALIST DEGREE IN VETERINARY MEDICINE

QUALIFYING TRAINING OBJECTIVES

Specialist Veterinary Medicine graduates must possess the scientific bases theoretical-practical preparation required to practice the veterinary profession, as well as the methodological and cultural bases required for full-time training and the fundamental techniques of scientific research.
The Class' specialist undergraduate must possess:

- fundamental theoretical knowledge of the basic sciences, in view of their subsequent professional application;
- the ability to identify and critically assess data relating to the state of health, welfare and pathology of single animals and livestock interpreting them in the light of basic scientific knowledge, physiopathology and pathologies of organs and body systems and performing the necessary medical and surgical operations to remove the state of illness;
- knowledge of epidemiology, diagnosis, prophylaxis, treatment and control of infectious and parasitic diseases in animals;
- the ability to identify and critically assess the state of wholesomeness, hygiene, quality and any alterations of foodstuffs of animal origin that may prejudice human health; students must also be familiar with the production and processing procedures of foodstuffs of animal origin;
- knowledge of animal nutrition and feeding and breeding technologies;
- the ability to identify and critically evaluate the impact of animal breeding on the environment.

The specialist graduates of the Veterinary Medicine class deal with the protection of animal health and the health of humans in contact with animals and those who consume foodstuffs of animal origin and contribute to the protection of the environment.
Specialist graduates operate in the national health service, private and public industry (in fields relating to animal breeding, pharmaceuticals, fodder and the processing of foodstuffs of animal origin) and in research institutes, as well as practicing as veterinary surgeons.

The training activities in the disciplines relating to basic training envisage the in depth study of matters of chemistry, biochemistry, anatomy and physiology necessary to understand biological phenomena.

The graduates must learn:

- the physical techniques of interest in the study of biological systems, the instruments required for the formation of elementary mathematical models and calculator applications for the numerical resolution of mathematical problems;
- organic and inorganic chemistry with particular reference to the macromolecules of biological interest, the biochemical concepts of the structural organisation of cells and metabolic processes in animals of veterinary interest; they must also possess general notions on the principles and techniques of chemical and biochemical analysis aimed also at the monitoring of environmental pollution;
- basic planta and animal biology and molecular biology;
- macroscopic, microscopic and ultra-structural notions of animal organisms;
- basic general veterinary and cellular physiology.

The training activities in disciplines characterising the class must aim to provide basic veterinary medical training; graduates of the class must be able to operate in the field of pathology, clinical medicine, and prevention of disease of animals as well as the control of hygiene and the quality of foodstuffs of animal origin.

In particular, the class's graduates in Veterinary Medicine must learn:

- the organisation of the various systems in domestic animal species with the fundamental notions of topographic anatomy and the structural organisation of animal organisms, also in an applied way;
- the functioning of animal organs and systems, also in an applied way, and the dynamic interaction between the various functions; they must also have understood the general foundations of animal behaviour and the factors that condition their welfare;
- the aethiopathogenetic mechanisms that concur in the presentation of pathological processes and the interrelations that take place between them and the various systems of the organism, the anatomy and pathological histology of organic systems and the nosological entities of domestic animals, microscope techniques and morphophysiopathological techniques and diagnostics;
- basic knowledge of epidemiology, aetiology, ways of transmission, prophylaxis, monitoring and diagnosis of infectious and parasitic disease in domestic animals, also in an applied sense, as well as the basic notions of hygiene and veterinary health organisation and veterinary policing regulations;
- the mechanism of action, pharmacokinetic and metabolism of medicines used in animals of veterinary interest and legal aspects connected to their use as well as the toxins most frequently used in the agricultural and animal breeding worlds;
- basic knowledge of the ethnological sector, genetics applied to the improvement of animal species and breeding techniques. Students must also acquire the basic concepts of animal breeding economics;
- the general concepts for the chemical and biological analysis of animal fodder and the factors that condition digestibility and use. Students must acquire concepts relating to food rationing, nutritional needs and administrative regulations governing the preparation and sale of all substances of nutritional interest of domestic animals.
- the clinical methods of direct and collateral semeiological investigations. Graduates must demonstrate mastery of the illnesses of organs and systems, including dysmetabolic, autoimmune and deficiency disorders. They must be able to recognise clinical symptoms in order to perform diagnosis and adopt suitable treatment;
- the fundamental techniques of general and local anaesthetic and main surgical techniques aimed at treating the various illnesses of various domestic species; students must also have learnt the fundamental physics required for image-based diagnostics;
- the fundamental aspects of physiopathology of reproduction in males and females in the various domestic species, also in an applied way;
- the methods and aims of ante- and post-mortem health inspections in various species of animals destined for slaughter, the basics of hygiene and food technology applied to the phases of production and sale of products of animal origin and the criteria, techniques and methods of inspections aimed at analysing the quality and state of health and preservation of the abovementioned products;
- the fundamental bases for certification and quality health documentation required for those operating in the foodstuffs sector, in order to verify conformity to current legislation and the necessary protection of public health. Ample space will be dedicated to the knowledge of Italian and European laws on health and sale, with the basic notions of common law. Students must also be aware of the issues connected to

the impact of slaughterhouses, transformation plants and the foodstuff industry on the environment.

Training activities in integrative subjects aim to allow students to develop studies on topics connected to human-animal relations, the characteristics for animal hospitalisation, livestock management, marketing, economic management of livestock, genetic and reproductive biotechnologies and molecular biology.

Training activities relating to the preparation of the final examination must allow the discussion of a thesis demonstrating the possession of the necessary professional competences. The indications provided in the Teaching Regulations also require the knowledge of one foreign language spoken in the E U.

The linguistic, computer and inter-personal skills useful for introduction into the working world and professional orientation must allow the graduates to reach the necessary maturity for occupational introduction, with reference also to professional opportunities in other EU countries and therefore the knowledge of the healthcare systems in other European Union countries, the methodology of continuing education and training, the development of specific attitudes in computer and/or technological fields are also required for the acquisition of the UTC for the practical training required to gain access to the professional authorisation examination.

With regard to the definition of courses of which the overall duration of five years is dedicated to the execution of the activities envisaged by directive 78/1027/EEC, the University Teaching Regulations are conform to the provisions of this decree and art. 6, comma3 of Ministerial Decree n.509/99.
The class' specialist graduates must have acquired specific medical and veterinary skills, having performed practical training for a period of no less than 30 UTC. This practical training, to be performed full-time in the periods established by the teaching structure, but preferably during the last year in the university or qualified public (local health Authorities, Zooprophylactic Institutes), or private structures (accredited by the competent academic organs) is compulsory for admission to the state exam.

The University Teaching Regulations also determine, with reference to art.5 comma3, of Ministerial Decree of November 3rd 1999, n. 509, the fraction of students' hourly commitment reserved for study or other individual training activities according to the specific training objectives followed and the performance of training activities with a high experimental or practical content.

ESSENTIAL TRAINING ACTIVITIES				
Training activities	**Disciplines**	**Subject sectors**	**UTC**	**Tot. UTC**
Basic training activities	**Disciplines applied to medical-veterinary studies**	FIS/07 – Applied Physics (to cultural and environmental heritage, biology and medicine) INF/01 – Information Technology ING-INF/05 – Data processing systems MAT/05 – Mathematical analysis MAT/06 – Probability and mathematical statistics MAT/07 – Mathematical physics MAT/08 – Numerical analysis SECS-S/02 – Statistics for experimental and technological research		50
	Plant and animal biological and genetic disciplines	AGR/07 – Agricultural genetics AGR/17 – General animal breeding and genetic improvement BIO/01 – General Botany BIO/03 – Environmental and applied Botany BIO/05 - Zoology		
	Disciplines of the structure, function and metabolism of molecules of biological interest	BIO/10 - Biochemistry BIO/11 – Molecular biology		
	Disciplines relating to the structure and function of animal organisms	VET/01 – Anatomy of domestic animals VET/02 – Veterinary physiology		
Characterising training activities	**Animal breeding, livestock and animal nutrition disciplines**	AGR/17 – General animal breeding and genetic improvement AGR/18 – Animal nutrition and fodder AGR/19 – Special Animal Breeding AGR/20 – Animal culture		70

	Morphology and function of animal organisms and infective and parasitic disease disciplines	BIO/10 - Biochemistry VET/01 – Anatomy of domestic animals VET/02 – Veterinary physiology VET/05 – Infectious diseases of domestic animals VET/06 – Parasitology and parasitic diseases in animals		
	Disciplines relating to pathological anatomy and veterinary inspections	VET/03 – General pathology and Veterinary Pathological Anatomy VET/04 – Inspection of foods of animal origin		
	Clinical veterinary disciplines	VET/07 – Veterinary Pharmacology and Toxicology VET/08 – Clinical Veterinary medicine VET/09 – Clinical veterinary Surgery VET/10 – Clinical Veterinary Obstetrics and Gynaecology		
Integrative training activities	**Interdisciplinary disciplines**	AGR/01 – Agricultural economics AGR/02 – Agricultural chemistry and crop growing AGR/10 – Rural constructions and field and forest territory BIO/12 – Clinical biochemistry and clinical molecular biology BIO/13 – Applied biology CHIM/10 – Foodstuff chemistry ING-INF/06 – Electronic and computerised bio engineering M-PSI/02 – Physiological psychology and psychobiology SECS-P/10 – Company organisation		30
Training activities	**Types**		**(a)**	**(b)**
Optional/elective subjects				15
For the final examination				15

Others (art. 10, comma 1, letter f)	Further linguistic knowledge, computer and interpersonal skills, practical training, etc.		18
TOTAL			**198**

ANNEX 4.2

PROGRAMMES OF THE COURSES
(IC : INTEGRATED COURSES; MC : MONODISCIPLINARY COURSES)

FIRST YEAR

I.C. – APPLIED BIOPHYSICS AND STATISTICS

Teachers: Enzo Tettamanti; Domenico Di Donato; Sergio Gigli

Objectives of the course:
Starting with a synthesis of the basic physical concepts learned in the pre university school, will be treated in depth items which are the cognitive and methodological bases for other specialized courses. The physics course, including also recalls of elements of mathematic and analytical geometry related to the specific physical items, is integrated with parts of *fundamentals of computer science* oriented at the learning of personal computer utilization with editing and statistical data analysis softwares; *fundamentals of statistics and applied statistics* oriented at approaching the student to the basic concepts of the statistics and their utilization at biological and veterinary field.

Programme:
Kinematics and dynamics: phenomena and basic laws: velocity and acceleration - motion equations - gravity and falling body - force - Newton's laws of motion - vectors and graphical method of adding, subtracting and projecting forces – torque and rotation – rotational motion and centripetal force – work - kinetic and potential energy – power
Fluids: phases of the matter – pressure – Pascal's principle – atmospheric pressure – pressure due to the weight of a fluid – buoyant force and Archimede's principle – cohesion and adhesion – surface tension – pressure inside a bubble (Laplace law) – capillary action – flowing liquids (Bernoulli effect) – viscosity – Poiseuille's law – sedimentation – sedimentation by centrifugation – transport phenomena – cardiovascular system – blood's viscosity – blood pressure measurement – diffusion – diffusion trough membranes – osmosis
Calorimetry and thermodynamics: pressure (kinetics theory) – thermodynamic equation of state – kinetic energy and temperature – methods of heat transfer – specific heath – thermodynamic transformations - thermodynamic cycles – 1° thermodynamic principle – Carnot's cycle - 2° thermodynamic principle
Electromagnetism: electric charges and forces – voltage – current – resistors – capacitors – Ohm's law - simple circuits – alternating current – resting potential on membrane structure – action potential – geometric optics – optical instruments: microscope basics – confocal microscopy – fluorescence microscopy
Atomic physics and radioactivity: rudiments of atomic structure, X ray, radioactivity and decay laws.
Computer science: PC architecture – hardware and software – bit and byte – RAM memory – mass memory - operative system and applied software – files – input and output devices (modem, printer, monitor) – the interfaces – elements on information code – network.
Practical exercises with the PC includes: use of Windows – multitasking – Excel's applications – statistical function in excel
Statistics: frequency and probability – dispersion index – analysis of variance – correlation – statistical hypothesis – tests – practical exercises.

I.C.: PROPAEDEUTIC BIOCHEMISTRY AND MOLECULAR BIOLOGY

Teacher: Roberto Giacominelli Stuffler

Objectives of the course:
The course aims at providing the fundamentals of organic chemistry. The structural and functional properties lipids, carbohydrates and proteins will be studied, with special emphasis upon myoglobin, haemoglobin and collagens.

Furthermore, the basic knowledge about the molecular and biochemical functions of prokaryotic and eukaryotic cells will be provided, highlighting their potential applications in the research fields of veterinary biotechnologies.

Programme:
The chemical bond.
The water ionization, the acids and the bases.
The hydrocarbons, the alcohols, the phenols, the thiols, the ethers, the carbonyl group, the aldehydes and the ketones, the carboxylic acids, the ammines and the amides.
The lipids.
The carbohydrates.
The amino acids, the peptides, the proteins.
The proteins of connective: the collagen and the elastin.
The myoglobin.
The haemoglobin: the haemoglobin A, the fetal haemoglobin, the sickle haemoglobin.
The thalassemias.
The cell membrane.
The DNA in prokaryotes: the duplication, the DNA mutations, the transcription, the translation, the genetic code.
Genes and DNA in eukaryotes: the duplication, the transcription and the translation.
The inhibitors of the duplication, the transcription and the translation in prokaryotes and eukaryotes.
Biotechnological applications of molecular biology.
The restriction enzymes.
The recombinant DNA technology and its applications.
The gene cloning.
The PCR.

I.C. VETERINARY BIOCHEMISTRY

Teacher: Daniela Barsacchi

Objectives of the course:
The course intends to give to the student the basic knowledge of the biochemistry of mammals and the correlations between the biochemical events occurring at the cellular level and the physiological processes in the animal organisms.
The first part of the course will cover the basic concepts and the general principles of the actions of proteins and enzymes as chemical catalysts in biological systems.
The main objective of the second part of the course will be the study of the metabolism, starting from the conservation of Energy, synthesis and degradation of the main cellular components. Finally, the third part of the course intends to give the knowledge of

biochemistry in the different apparatus and systems and their integration, in order to reach a better understanding of the "molecular logics of life".

Programme:

ENZYMOLOGY - Introduction: chemical reactions, acids and bases, equilibrium and Le Chatelier's principle. pH and buffer solution. Redox reactions. Enzymes: general concepts and classification of enzymes. Enzyme specificity: the enzyme's active site. Vitamins and cofactors. Isoenzymes. Enzyme kinetics: the steady state theory, Michaelis-Menten kinetics, Lineweaver-Burk linearization . Km and Kcat. Enzyme inhibition: feedback inhibition. Competitive and non-competitive inhibition of enzymes. Enzyme regulation by allosteric and covalent modification. Allosteric enzyme: Aspartate Transcarbamylase. Covalent modification: enzymatic cascade and amplification of the hormone signal. Regulation by reversible covalent modification: Glycogen Phosphorylase. Regulation by irreversible covalent modification: pancreatic proteases and blood coagulation.

METABOLISM - Bioenergetics and oxidative metabolism: The laws of thermodynamic and energy-rich components in cells. The concept of phosphate bond energy. The role of ATP in bioenergetics. Standard oxidation. Free energy in redox reactions. Redox reactions in biochemistry. Electron transporters (NADH + $H^+$and $FADH_2$). Electron transport and ATP production: Respiratory chain and oxidative phosphorylation. Chemiosmotic mechanism. Thermogenin. Function and structure of the ATP synthase. Malate-aspartate shuttle and glycerol phosphate shuttle. Membrane transport: Passive transport system: co-transport systems, sugar transporters. Active transport systems: structure and mechanism of Na^+K^+-ATPase. Ionophores. Carbohydrates metabolism: Digestion and absorption of carbohydrates. Glycolysis and glycolytic pathway. Lactate and alcoholic fermentations. Cori-cycle. Energy production. Regulation of glycolysis and Pasteur effect. Shunt of pentose phosphate and regulation. Catabolism of glycogen. Hydrolysis and phosphorolysis. Regulation mechanisms of glycogen phosphorylation. Piruvate oxidation: piruvate dehydrogenase multienzyme complex system. The tricarboxylic acid cycle: The citric acid cycle, anaplerotic pathway. Regulation of the cycle. Gluconeogenesis: biosynthetic pathway. The gluconeogenesis substrates. The liver's role in supplying free glucose to other tissues. Regulation of hepatic neoglucogenesis and glycolysis. Fructose-2,6-bisphosphate. Synthesis of glycogen: biochemical pathway and regulation. Lipid metabolism: Digestion and absorption of fatty acids. Lipoproteins: properties of the individual lipoproteins. Transport of fatty acids in mitochondria. Fatty acids β-oxidation. Ketone bodies metabolism. Cholesterol: transport, biosynthesis and regulation. Fatty acids biosyntesis. Fatty acids syntetase. Regulation of lipid metabolism. Malonyl-CoA as a regulatory molecule. Metabolism of nitrogen compounds: Amino acid catabolism and aminotransferases. Glutamine metabolism. Aminotransferase and piridoxal phosphate. The pyruvate-alanine cycle. Glucogenic and ketogenic amino acids. Transport of nitrogen to liver and kidney. Urea cycle. Krebs Di-cycle. Biosynthesis of dispensable amino acids. Purine and pyrimidine biosynthesis. Synthesis and utilization of 5'-phosphoribosil-1-pyrophosphate.

BIOCHEMISTRY OF SYSTEMS AND APPARATUS - The molecular basis of communication between cells: hormones, hormones-receptors and signal transduction. Blood: plasma, red cells and lymph. Hepatic tissue: metabolism and detoxification reactions. Adipose tissue: lipolysis and thermogenesis. Digestive tract: intestine, stomach and rumen. Muscular tissue: skeleton muscle, heart and smooth muscle. Nervous tissue: neuron, neuron-regulators and neuron-transmitters. Bones and dental tissue: calcium metabolism and phosphate metabolism. Kidney: membrane transport systems, re-absorption and regulation of hydro-saline equilibrium and acid-base equilibrium. Metabolic mutual relation and hormonal integrated control. Rumen: biochemical and biotechnological peculiarity.

I.C. VETERINARY ANATOMY

Teachers: Paolo Beradinelli, Massimo Mariscoli, Giovanni Aste

Objectives of the course:

Main aim of the course is to give the students the knowledge of systemic anatomy in order to correctly individuate the exact position of different organs to allow an accurate clinical control of patients. Moreover the students must know the topographic connection between the different organs as illustrated by the mean of imaging diagnostic. Furthermore, the students may identify the different organs. The teaching activity will be done with a large support of video concerning dissectory anatomy and in a practical way with small groups of students, using domestic animals cadavers.

Programme:
Cytological and histological basis: Structural organisation of cells: plasma membrane; nucleus; cell organelles (RER, SER, Golgi apparatus, mitochondrial, lysosomes, centrioles). Muscular tissue. Nervous tissue. Epithelium and glands. Connective and supportive tissues. Bone. Blood cells.
Anatomy lectures. Terminology. General aspects on the head, neck, legs and trunk of the animals. General and comparative anatomy of respiratory, digestive, circulatory, uro-genital and nervous systems. Skin and annexes. Eye and ear.
Practical anatomy. Dissection of the head, thorax, abdomen, pelvis and eyes with particular reference to different plans and organs topography. All the practical work will be submitted to auto-evaluation tests.
Clinical methods, ultrasound and normal radiology. Contemporarily to the practical work, students will receive lectures and tutorial lessons concerning the relationship between topographic anatomy, clinical and diagnostic imaging investigation to evaluate normal organs.

I.C. ZOOLOGY, ETHNOGRAPHY AND ETHOLOGY

Teachers: Claudio Venturelli; Giorgio Vignola; Pia Lucidi

Objectives of the course:
The course is divided into three sections and aims to provide fundamental information regarding animals' classification, animals' identification and animal behavior. At the end of the course the students should be able to recognize the most important animal species: farm, companion and wild species; evaluate and judge the different traits associated to production; have basic knowledge about animal behavior in particular companion animals.

Programme:
The animal Kingdom. Classification of Animals: methods and purposes, species and higher groups. Nomenclature: common names and scientific names. Animal reproduction: asexual and sexual reproduction, mitosis and meiosis, spermatogenesis oogenesis, fertilization. Special types of sexual reproduction: parthenogenesis and hermafroditism. Structure and natural history of Chordates. U rochordata, Cephalochordata and Vertebrata. Characteristics external features, integument, skeleton, locomotion, feeding, respiratory system, excretory system, nervous system and sense organs, reproduction and development, relation to man of the following taxa with particular reference to ltalian fauna: Cyclostomata, Chondrichthyes,

Osteichthyes, Amphibia, Reptilia, Aves, Mammalia. Morphological evaluation of the main Italian and non-Italian breeds of companion and productive animals species. Knowledge of the animal: principles of animal morphology, zoognostics definition. Morphological types in relation to species and functional aptitude. General definition: beauty, qualities, defects, tare. Zoognostic regions: terminology, body division of regions. Canine zoognostic and its functional correlations with aptitudes. Age: evaluation techniques. Classification of canine groups depending on history and different countries; dog breed standard; canine genetic selection; the fourteen Italian breeds (origins, aptitude, importance, morphological standard). Equines: origin of the species; basic of equine zoognostic; horse's pace; coat color in horses; estimation of age using of teeth table; classification of different equine group depending on the age and country; horses breed standard; equine genetic selection; the Italian equine breeds. Cattle: dairy and beef. Basic of dairy and beef cattle zoognostic; Italian and International cow breeds: origin and diffusion; morphological standard. Sheep: milk, meat and wool aptitude. Basic knowledge of zoognostic ; Italian and International sheep breeds: origin and diffusion; morphological standard. Goat. Basic knowledge of zoognostic ; Italian and International goat breeds: origin and diffusion; morphological standard. Swine. Basic knowledge of zoognostic ; Italian and International pig breeds: origin and diffusion; morphological standard.
Introduction to ethology: ethology history, the time, theory and man, fundamentals of motivation and model; stimuli releaser; animal behavior philology and ontogenesis; neuroendocrine system organization: hormonal regulation of behavior testosterone and aggressivity; pheromones and the vomeronasal organ; stress: surrenal gland, amigdala and hippocampus functions; casualty sensors, non-associative learning, reinforce, reinforce administration, shaping, superstition; classification, offspring imprinting, sexual imprinting, instinct driven learning, vocal learning; memory; 1st ad 2nd type memory, cerebral asymmetries evolution, spatial memory; social mind, audience effect, lying, deceit, mind's theory, imitation, teaching, self-awareness, altruism; intelligence: insight, detour; work memory; expectation cells, problem solving and tools utilization, language, conscience.

M.C. GENERAL ECONOMY AND MARKETING

Teacher: Giuseppe Bonanni

Objectives of the course:
To learn basal concept of general economy and marketing and to apply them to operating models.

Programme:
Introduction. Economy general principles. Economic models. Simulation models and optimising models. Demand and supply rules. The production curve. Economicity, income and capital. Productivity and costs. Marketing of agro-industrial products. The knowledge of the market. The consumer and its actions. Marketing strategies. Segmentation. Marketing procedures.

M.C. ENGLISH AS A FOREIGN LANGUAGE

Teacher: Francesca Rosati

Objectives of the course:
The main goal of this course is to give students linguistic skills and provide the necessary approach and tools in order to optimize their ability for problem-solving in the interpretation of English texts and documents in scientific domains.

Programme:

Particular attention will be placed not only upon the characteristics of *morphology* and those of *English syntax* but more importantly upon the study of *lexical collocations* and *morphosyntactic structures* that define ESP (English for Specific Purposes) for the Faculty of Veterinary Medicine. The didactics will include materials in the original English language taken from various scientific articles, books, volumes and so on. From these articles the tasks of reading for pronunciation, text analysis and translations will be carried out. The linguistic variety of such means enable the differences of specialized terminology regarding *lexicon*, *phonetics*, *morphosyntactic structures* and *spelling* in both British and American English to be constantly verified.
The exam will be as follows:

1. TOESP (*Test of English for Specific Purposes*) on *morphosyntactical structures*, *lexicon* and *phraseologies* of English in scientific domains*;* no use of a dictionary is allowed for this section;
2. a written translation from English into Italian based on a scientific passage *(*the use of a bi-lingual dictionary is allowed for this section)
3. an oral section regarding the arguments discussed throughout the course plus a scientific reading passage for pronunciation and an at-sight translation picked by the exam committee.

SECOND YEAR

I.C. VETERINARY PHYSIOLOGY, PART I.

Teacher: Pasqualino Loi, Andrea Boari

Objectives of the course:

The first part of the Veterinary Physiology course aims at delivering the students the background necessary for the understanding the origin of molecules and life, development and evolution of multicellular organism, the mechanism of cellular differentiation, and the interrelationship among organs in a normal individual. To this extend, students will be taken through both frontal lesson to practical courses ranging from basic functions, to apparatus physiology, stressing on the connection between physiology with the more professionally oriented disciplines.

Programme:

General Physiology. Basic structure and function of the cells. Cell differentiation. Cell metabolism. Cell membrane: biophysics properties. Transmembrane ionic shift. Membrane transport. Physic-Chemical gradients regulating trans-membrane fluxes. Trans-membrane rest and action potentials. Receptors, effectors, signal transduction, agonists and antagonists. Nervous system. The neuron as an exitable cell. Activation potential in neurons. Generation and transduction of the electric signal in neurons and nerve fibres. The Swann cell and the impulse conduction. Synapsis. Pre and post synaptic inhibition. Generation of stimuli in sense organs. Receptors: classification and general properties. Adaptation of the receptors: tonic and phasic receptors. Spinal reflex. Skeletal muscle stretch receptor. Neuromuscular spindle. Estesiology, afferent sensory nerves: Archeo, Paleo and neo Spino-talamic pathways. Thalamic somatotopic projection. Sensory cortex. Pain. Analgesy. Electroencephalogram. Sleep – rest rhythm. The vestibular system. Brain control of posture and locomotion. Pyramidal and extra-pyramidal systems. Basal ganglia. Cerebellum. Vestibulo-cerebellum, spino-cerebellum, and cerebro-cerebellum. The Autonomic Nervous System (SNA) and adrenal medulla. Organization and neurotransmitters of SNA. Hypothalamus, neurovegetative control. Neuropeptides. Limbic system and behavioural control. Cerebrospinal fluid, blood-brain barrier Glia cells. Muscle physiology. Skeletal muscle. Neuromuscolar junction e colinergic system. Post synaptic potential. Electromechanical coupling in muscle contraction. Molecular mechanism of muscle contraction. Mechanistic Aspect of muscle contraction. Cardiac muscle, smooth muscle. Muscle fibre metabolism. Slow and fast fibre. Multi-monounitar smooth muscle. Blood and liquid compartments of the body. Blood composition. Plasma and blood cells. Plasma Function. Plasmatic proteins. Haematocrit. Red blood cells, functions and properties. White blood cells, functions and properties. Blood groups. Coagulation. Lymphatic system. Cardiovascular physiology. Electrical activity of the hearth. Hearth as a pump. Cardiac cycle. Cardiac oupput and its regulation. Systemic and pulmonary circulations. Capillaries and fluid exchange. Local control of blood flow. Neural and hormonal control of blood pressure and volume. Special circulation districts: blood brain barrier, hepatic circulation, coronary circulation. Integrated cardiovascular responses. Hypertension. Thermoregulation. Kidney physiology. Kidney vascularisation. Glomerular filtration. Tubular re-adsorption. Regulation of extracellular fluid and composition. Acid-base balance. Diuretics. Bladder function. Chemical and physical properties of urine. Practical courses (total of 14 hours) Cell physiology. Visualization of subcellular structures, nuclei, mitochondria, in living cells. Citoskeleton. Cell differentiation. Behaviour of cell in culture. Spinal reflexes. Measurement of main cardiovascular parameters; blood pressure, cardiac tones, Blood, plasmatic protein determination, red blood cells parameters (MCV, MHC,

MHCH).While blood cell identification (Giemsa staining of blood smears). Tutorials (interactive physiology software)

I.C. VETERINARY PHYSIOLOGY II AND ENDOCRINOLOGY

Teachers: Barbara Barboni, Mauro Mattioli, Domenico Robbe.

Objectives of the course:
The course, from cellular physiology and general control mechanisms of nervous and cardio circulatory system, give attention to single apparatus functions. Particularly details will be given on digestive physiology emphasizing differences among monogastric and ruminant species; respiratory system and adaptative response; reproductive physiology; lactation. The integration with clinical subjects will prepare the students to practically register the normal functions of different systems on animals.

Programme:
Breathing mechanisms. Pulmonary ventilation. Oxygen and carbon dioxide transport. Regulation of respiration. Respiratory clearance. Digestive strategies in domestic species. Regulation of appetite. Prehension, mastication. Salivary secretion; composition and functions of saliva. The stomach; contraction and secretions. The pancreas and the liver. Digestion and absorption in small intestine. The fore-stomach; contractions of the reticulum and rumen and their regulation. Rumination, eructation. Microorganisms in the rumen; metabolism of carbohydrates, proteins and fats in the fore-stomach. Absorption from the fore-stomach. The large intestine. Defecation. Hormonal control of body metabolism.
Male reproductive processes: spermatogenesis, hormonal control of spermatogenesis, puberty and photoperiod. Reproductive behaviour. Ovarian function: folliculogenesis, ovulation and corpus luteum. Female reproductive processes: puberty, oestrous cycle, pregnancy and parturition. Details will be given for bovine and swine; sheep, horses, dog and cat will be also treated. The mammary gland and lactation. Mammogenesis and galactopoiesis. Milk synthesis and secretion.
Veterinary aspects of reproductive physiology will be emphasized with general concepts of semeiotics and the objective examination of reproductive organs of normal animals during different moment of their reproductive cycle.
Hormones chemistry, receptors and mechanisms of action. Pituitary and hypothalamic hormones. Regulation of hormone secretion and activity. The thyroid gland: biosynthesis, secretion, transport and action of thyroid hormones. Endocrine pancreas: biosynthesis and action of insulin and glucagons. The adrenal gland: biosynthesis and action of glucocorticoids. Regulation of calcium and phosphorus metabolism. Growth hormone: biosynthesis and action. Reproductive and lactation endocrinology.

M.C. VETERINARY FUNCTIONAL ANATOMY

Teacher: PierAugusto Scapolo.

Objectives of the course:
Students completing this subject should comprehend the comparative structure of organ systems in different species of domestic animals; the relationships between microscopic structure and function of each of the following types of anatomical structures. This will provide not only a knowledge for the immediate purposes of passing the course, but will offer

a basis upon which to continue learning and to make decisions related to the practice of medicine.

Programme:

Nervous system and its components. Histology and functions of the neuron. Structural and functional classification of nerve fibers. Morphogenesis of the central nervous system, formation of ependyma, gray matter and white matter. Histological structure of telencephalon, diencephalon, mesencephalon, metencephalon and myelencephalon. Structure of the spinal cord. Hypophyseal - hypothalamic relationship. Origin, route and distribution of the cranial nerves. Synapses, receptors and various tracts. The autonomic nervous system. Body reflexes. Special sense organs, their structure and functions. Muscular system. Types of striated fibres (red, white, oxidative, glycolitic). Neuromuscular plate/ neurotransmitters. Types of smooth muscle (unitary vs multiunit smooth muscle). Influences of the autonomic nervous system. Circulatory system: the arterial and venous system; the wall of the vessels; the microcirculation. The blood-brain barrier. The heart: atria and ventricles. Conducting system: the sinoatrial node, the atrioventricular node, the Purkinje fibers. The function of heart valves. Lymph vascular system. Histology of: thymus, spleen, lymph node and mucosa associated lymphoid tissue. Urinary system: structure and function of the kidney; basic organisation of the nephron, collecting system and renal vasculature. The general structure of the ureters and bladder. Control of the bladder filling/emptying. Respiratory system: conducting system and sites of gas exchange . Structure and function of the respiratory muscles. The digestive apparatus. Oral structures and tissues. The gastrointestinal system: components of the wall and basic mucosal forms. Functional consideration. Control of the movements of the gastrointestinal tract. Histology of the liver, gall bladder and pancreas. Histology of the female reproductive organs; ovaries, oviduct, uterus, cervix uteri, vagina, vulva and mammary glands. Structural changes in the reproductive organs in different stages of the cycle. Histology of the male reproductive organs. The endocrine glands.

I.C. GENERAL PATHOLOGY AND VETERINARY PATHOPHYSIOLOGY

Teacher: Giovanni Di Guardo

Objectives of the course:

The Teaching Course “General Pathology and Veterinary Pathophysiology”, which is partitioned into two sub-Courses (“General Veterinary Pathology” and “Veterinary Pathophysiology”), is aimed at providing a general overview and at clarifying, along the conceptual view of “function-dysfunction”, the aetiological factors and the main pathogenetic mechanisms which are involved in the determinism of general disease processes affecting the host’s (animal’s) cells, tissues, organs and apparatuses. In this respect, special emphasis is placed upon the topics “inflammation” and “immunopathology”, as well as on the scientific terminology which is commonly utilized in the “language of pathology”. Theoretical-practical sessions (covering 8 hours out of total 78 teaching hours), to be organized in the “histopathology” and “immunohistochemistry” laboratories, as well as in the “light microscopy” room, are also included in the Teaching Course.

Programme:

List of topics included in the Course arranged in chronological order:

Introduction to the Course: the concepts, the scopes and the “language” of “Pathology”, “General Pathology” and “Pathophysiology”. The utility of “Veterinary Pathology” and “Comparative Pathology”, along with the concepts of “health”, “homeostasis” and “disease”. “Natural disease” and “experimental disease”: animal models of human disease and their relevance in comparative pathology.

The concepts of “aetiology” and “pathogenesis”. Aetiological factors (agents) of disease and their classification. External (exogenous or extrinsic), internal (endogenous or intrinsic), essential, sufficient, insufficient, predisposing disease agents and etiologic co-factors (or disease concauses).
Apoptosis and necrosis: main features and differences.
Physical agents of disease: mechanical trauma, electrical trauma, heat, cold, radiant energy (radiation injury), pressure, ultrasound.
Chemical agents of disease: biologic toxins (poisons), mycotoxins, pesticides, herbicides, organochlorines, heavy metals, environmental contaminants.
Nutritional agents of disease: dietary excess, nutritional deficiencies, starvation.
External deficiencies: water, oxygen and sunlight deficiency.
Biologic agents of disease: prions and viruses, along with some examples of prion-induced and virus-induced animal disease conditions; mycoplasms, rickettsias, chlamydias, bacteria, algae, fungi, protozoan and metazoan parasites, arthropods, insects. Direct and indirect laboratory techniques utilized in the diagnosis of infectious and parasitic disease conditions in animals. The “histopathology” and “immunohistology” (“immunohistochemistry”) laboratories, along with their role in the identification of biological agents within animal tissues (theoretical-practical session to be carried out in the above laboratories).
Blood pathophysiology: erythrocyte disturbances (anaemia) and white cell disturbances (leukopenia, leukocytosis, lymphopenia, lymphocytosis).
Cardio-circulatory pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts). Pathophysiology of shock and edema.
Nervous system pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts). The examples of sheep and goat scrapie and of bovine spongiform encephalopathy (BSE) in cattle (projection and discussion of two videos showing the clinical signs of scrapie in sheep and goats and of BSE in cattle, respectively). Pathophysiology of stress.
Renal and urinary system pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts).
Pathophysiology of blood acid/base balance.
Inflammation: general concepts, historical notes and pro-inflammatory agents. Acute and chronic inflammation: main biological features, evolutionary stages, inflammatory cells, chemical mediators of inflammation, types of inflammation (inflammatory exhudate’s types), systemic signs of acute inflammation (fever). Granulomatous inflammation: foreign body granulomas, infectious granulomas, parasitic granulomas.
Tissue repair (healing) processes: basic concepts.
Theoretical-practical session in the “light microscopy” room, focused on the observation and subsequent discussion of a number of histologic sections showing different types of acute and chronic inflammatory lesions in animals.
Respiratory pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts).
Digestive pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts).
Hepatic and pancreatic pathophysiology: from biochemical and morphological alterations to dysfunction and clinical symptoms (basic concepts).
Immunopathology: general concepts. Normal and abnormal immune reactions, along with their main differences. Immediate-type and delayed-type hypersensitivity reactions: aetiological factors, main pathogenetic mechanisms involved and examples of such reactions in veterinary medicine. Autoimmunity and autoimmune diseases: aetiological factors, main pathogenetic mechanisms involved and examples of such pathologic conditions in veterinary

medicine. Primary and secondary immunodeficiencies: aetiological factors, main pathogenetic mechanisms involved and examples of such pathologic conditions in veterinary medicine.
Host's immune defense mechanisms against tumours and tissue/organ transplants (transplantation): basic concepts.
Class general discussion on all the different topics dealt with during the Teaching Course.

M.C. VETERINARY MICROBIOLOGY

Teacher: PierGiorgio Tiscar

Programme:
Bacteriology: structure and functions of procaryotic cell; principles and methods of cultivation, isolation and identification; mechanisms of pathogenesis; classification and characteristics of the main groups; genetic exchange and recombination; biotechnology principles in bacteriology; antimicrobial agents; theory and practice of sterilization.
Virology: structure and characteristics; replication cycle and cytophatic effects; principles and methods of cultivation, isolation and identification; mechanisms of viral interference; classification and characteristics of the main groups.
Immunology: definition and characteristics of antigen; structure of microbial antigens; introduction to innate immunity; phagocytosis; complement; introduction to specific acquired immunity; antibodies and humoral immunity; cell-mediated immunity; mucosal-associated immunity; passive immunity; vaccines and vaccination; principles and methods of serological reactions.

I.C. GENERAL PHARMACOLOGY AND VETERINARY TOXICOLOGY

Teacher: Michele Amorena

Objectives of the course:
The course has the finality to give the bases for a correct understanding of the pharmacology and the general toxicology. Particularly, the student has to know the mechanisms pharmacodynamics and pharmacotoxicokinetics of the xenobiotics in the different animals, the main basis of toxicology of the residues, of ecotossicology and the problem list to them correlated.
Programme:
Purposes of the Pharmacology and the Veterinary Toxicology and relationship with the other disciplines. Definition of medicine and poison. Solutions, dilutions and them preparation; concentrations unit; examples and calculation. Definition of dose. Dose-response relationship. Law of mass. Gradual and quantal response. Dose without effect. Effective dose (ED1-ED100). Toxic dose. Lethal dose (LD1-LD100). Therapeutic Index, drug manageability, safety factor and safety standard border. Calculations, graphic representations and interpretation of the dose-response relationship. Translocation of drug molecules. Drug absorption and related factors; distribution, sites of deposit and redistribution; drugs metabolism: enzymes responsible of the biotransformation, factors that influence the drug metabolism; renal excretion of drugs and drug metabolite, biliary excretion and enterohepatic circulation, mammary excretion and other ports of elimination. Pharmacokinetics parameters: clearance (Cl), volume of distribution (Vd), halflife (t1/2), bioavailability (AUC), pharmaceutical bioavailability (F). Calculations parameters. Receptor protein and mechanisms of signal transduction. Agonists and antagonists. Desensitization, takhyphylaxis,

down and up regulation. Drugs-receptor interaction. Affinity and competition. Characteristics of drug-receptor binding. Pharmacodynamics and toxicodynamics, pharmacogical-toxicological interactions in dynamic phase and in kinetic phase. Therapeutic associations, pharmaceutical forms, route of drugs administration and toxic substances absorption. Concepts of pharmacovigilance and pharmacosurveillance: ADR. Residue definition, NOEL, NOAEL, LOEL, LOAEL, ADI, MRL, time of suspension. Different methodologies of samples collection and pharmacological and toxicological analysis. Clinical-toxicological file. Notice of ecotossicology, bioindicators, bioconcentration, bioaccumulation and biomagnification. Main analytical methods for the determination of xenobiotics in the organic samples (Spettrofotometry, TLC, HPTLC, HPLC, GC, GC-MS, AA).

I.C. HISTOLOGICAL AND GENERAL PATHOLOGICAL ANATOMY

Teacher: Giuseppe Marruchella

Objectives of the course:
The present training program aims at providing a basic understanding of how diseases develop in domestic animals. The etiology and the pathogenetic mechanisms occurring in cells, tissues and organ systems will be explained. A foundation course covering the general aspects of veterinary pathology will be provided. A special emphasis will be placed upon the etio-pathogenesis and the kinetics of degenerative changes and neoplastic disorders. The course is designed to introduce students to the terminology and concepts of veterinary pathology and to provide them with a grounding in general disease mechanisms. Lectures will be supplemented by practical classes in gross and microscopic pathology in order to exercise the students' problem solving attitudes.
Programme:
Introduction to General Veterinary Pathology: training program overview, advised text-books, evaluation form.
Definition and aims of General Veterinary Pathology: from biochemical damage to functional and morphological changes. Methods in Veterinary Pathology: theory and practice.
Cellular adaptations of growth and differentiation: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia, anaplasia. Slide seminar training.
Neoplasia: definitions, nomenclature, basic biology of cancer. Basic characteristics of benign and malignant tumors. Molecular basis of multistep carcinogenesis: oncogenes, cancer suppressor genes, genes regulating apoptosis, DNA repair genes. Biology of tumor growth: tumor angiogenesis, tumor progression. Mechanisms of local and distant tumor spread: metastases. Etiology of cancer: chemical and physical carcinogens, viral oncogenesis. Host defense against tumors. Grading and staging of neoplastic disorders. Diagnostic approach in veterinary oncology: theory and practice. Slide seminar training. Case report presentation and discussion.
Morphology of cell injury and cell death: intracellular accumulation of water, lipids, proteins, glycogen, lysosomal storage diseases, apoptosis and necrosis. Slide seminar training. Case report presentation and discussion.
Morphological changes of connective tissues: metabolic disorders, hyalinosis, fibrinoid necrosis, amyloidosis, myxomatous degeneration. Case report presentation and discussion.
Pathological pigmentations: exogenous and endogenous pigments. Pathological calcification. Slide seminar training. Case report presentation and discussion.
Hemodynamic disorders: hyperemia, hemorrhage, thrombosis, embolism, infarction. Case report presentation and discussion.

THIRD YEAR

IC: VETERINARY SPECIAL PATHOLOGICAL ANATOMY AND NECROPSY

Teacher: Leonardo Della Salda

Objectives of the course:

Knowledge of anatomo-histopathology of diseases of organ systems, concerning their macroscopic and histological features as well as their aetiology and pathogenetic mechanism involved. Ability to diagnose both macroscopically and histologically, the most common lesions and formulate differential diagnosis. Methods of how to evaluate organs macroscopically and on histopathological basis. The course deals with the pathological changes of organs in animal diseases, in response to the various injury factors. The programme is limited to the systemic pathology of the organ systems, and completed the previous course General Pathological Anatomy. Necropsy techniques are included in this course as a specific unit. Lectures are supplemented by gross pathology demonstrations, necropsies and practical work. Teaching material is in part provided by the diagnostic service of the Clinical Department (dogs, cats, and in part by external private slaughterhouses).

Systemic pathology. For each organ or system lectures will cover organ physiopathology, malformations, circulatory disturbances, regressive processes, inflammations, parasitic diseases, tumours. Morphological and pathophysiological aspects of disease will be also related to clinical findings. All major diseases concerning the organ systems in question will be discussed, but special attention will be focused on those that cause major health problems in ltaly.

Programme.

Special Pathological Anatomy. Special pathology of the following organ systems of domestic mammals will be considered:

Skin: primary and secondary lesions, necrosis and gangrene, hypertrichosis, hyperkeratosis, dermatitides, cysts, hamartomas, tumour-like lesions. Immuno-haematopoietic system: bone marrow and thymus lesions; lymph nodes: atrophy, pigmentations, degenerations, necrosis, lymphadenitis; spleen: regressive processes, splenitis. Cardiovascular system. Heart: hydropericardium, pericarditis, cardiac haemopericardium, myocardosis, hypertrophy, cardiomyopathies, endocardiosis, endocarditis. Vessels: ruptures, aneurysms, thrombosis and embolism, regressive processes, arteritis, phlebitis, thrombophlebitis, lymphangitis. Respitatory system: rhinitis, laryngitis, tracheitis, bronchiectasis, bronchitis, bronchiolitis, atelectasis, emphysema, pneumonias, pneumoconiosis, pneumothorax, hydrothorax, chylothorax, haemothorax, pleurisy. Gastroenteric tract and peritoneum: stomatitis, tonsillitis, megaesophagus, oesophagitis; forestomachs of ruminants: abnormal contents, rumenitis; stomach: heterotopias, stenosis and dilatations, ulcerative lesions, gastritis; intestine: dystopias, atresia and stenosis, enteritis, tumour-like lesions; peritoneum: ascitis, peritonitis. liver (malformations, circulatory disturbances, regressive processes, inflammations, parasitic diseases, tumours), pancreas (malformations, circulatory disturbances, regressive processes, inflammations, parasitic diseases, tumours), Urinary system: heredo-familial nephropathies, nephrosis, nephritides, urolithiasis, ureteritis, cystitis, hydronephrosis. Mammary gland: mastitides, neoplasms of domestic carnivors. Bones: abnormalities of development - Chondrodysplasias, osteochondrosis-, metabolic diseases, (osteoporosis, osteomalacia), Degenerative diseases (Inflammatory diseases, neoplastic and tumor conditions. Joint: Degenerative diseases (Arthropaty, Spondylosis), Arthritis, tumors. Muscle Muscolar dystrophy, circulatory disturbance, myopathy, myosytis, parasitic diseases, neoplastic diseases. Nervous system: neurodegenerative diseases, Inflammation of SNC, neoplasia.

Female and male genital systems (malformations, circulatory disturbances, regressive processes, inflammations, parasitic diseases, tumours).
Moreover, for all the above-mentioned systems: circulatory disorders, parasitic lesions, and neoplastic conditions. Histopathology. Brief overview of the main techniques employed in histopathology. Histopathology of the following topics: inflammation of the mucous and serous membranes; spleen and lymph nodes (hyperplasia, acute and chronic inflammation, lymphoma); heart (infarction, myocarditis, endocarditis); lung (edema, emphysema, atelectasia, bronchopneumonia, fibrinous and interstitial pneumonia); liver (jaundice, steatosis, necrosis, chronic passive congestion, purulent, pyogranulomatous and interstitial hepatitis, cholangiohepatitis, cirrhosis); kidney (infarction, degenerative changes, glomerulonephritis, purulentand interstitial nephritis); testis (atrophy, orchitis, tumours); prostate gland (hyperplasia, purulent inflammation); ovary (cysts, tumours); uterus(cystic hyperplasia-pyometra complex); mammary gland (mastitis, tumours); dermatitides; muscle (atrophy; hypertrophy; necrosis; myositis); central nervous system (encephalomalacia, purulent, non purulent and granulomatous encephalitis, tumours).
Necropsy
Definition, aims, importance and limits of autopsy. Tanatology. Forensic veterinary medicine. Equipment. Cautions to take before, after and during the necropsy. Anamnesis, external examination and preparation for evisceration. incision of cutis, subcutis examination, opening and examination of abdominal cavity, thoracic cavity, head, mouth and nasal cavity, neck and pelvis. Examination of single organs. Postmortem changes versus ante-mortem lesions. Epicrisis and autoptic report. Specimen collection.

I.C. PHARMACOLOGY AND SPECIAL VETERINARY TOXICOLOGY

Teacher: Michele Amorena

Objectives of the course:
The student has to show to know the mechanism of action, the pharmacokinetics and the metabolism of the drugs used in pets and large animals, in particular stressing the differences among the species. The student has to have understood the different procedures of administration of such drugs in order to provide preventive or therapeutic treatments. Furthermore the student has to know the related legislative aspects as well as the toxic substances more frequently responsible of poisoning in the animals, their source and their toxicodynamic and toxicokinetics properties in order to protect the animal and the public health and the environment.
Programme:
Drugs of the autonomous nervous system: adrenomimetic and antiadrenergics drugs, parasympathomimetics and parasimpatholytics. Drugs of neuromuscular block. Active drugs on the central nervous system: general anesthetic: clinical stadiums of the anesthesia. Inhalatory and injectable anaesthetics**.** Neuroleptanalgesia. Narcotic analgesics and not narcotics. Psychotropic drugs, stimulating of the central nervous system.
Anesthesia of the peripheral nerves: local anesthetics.
Drugs affecting the cardiovascular system:. digitalis, antiarrhythmics.
Istamina and antihistaminic. Drugs affecting hydroelectrolitic balance. Diuretics.
Drugs acting on respiratory apparatus: anticough, expectorant and mucolytic.
Drugs for the digestive apparatus: Antacid and antiulcer. Emetic and antiemetic drugs. Laxatives and purgatives.
Chemoantibiotics: β-lactam antibiotics, aminoglycosides, tetracyclins, chloramphenicol, macrolides, rifamycin, sulphonamides, fluoroquinolones. Antimycotic agents.

Chemotherapy of the parasitosis: anthelminthic drugs, antiprotozoal drugs.
Special Toxicology
Poisoning from: carbon monoxide; sulphurous anhydride; nitrogen oxides; urea and salts of ammonium; nitrates and neighs; Chlorine and its salts; Fluorine; Arsenic; Mercury; Lead; Cadmium; Copper; Selenium; hydrocyanic acid and cyanides; organochlorines; organophosphorics; carbamates; herbicides; fungicides; natural pyretroids and synthetic pyretroids; molluscacides; rodenticidals; strychnine; mycotoxins;
Toxic plants: plants rich in nitrates and neighs; plants cyanogenetics; plants containing oxalic acid and oxalates; plants photosensibilization.
Marine biotoxins.
The doping of the animals.
Environmental pollutants. Dioxins. Polichlorobyphenils. IPA. Metals

I. C. PARASITOLOGY AND PARASITIC DISEASES OF ANIMALS

Teachers: Donato Traversa; Antonio Gatti.

Objectives of the course:
Aetiology, biology, epidemiology, pathogenesis, symptoms, pathological anatomy, diagnosis, control and molecular biology of the most important parasitosis of veterinary concern and of zoonotic parasitosis.

Aims of the course are to provide:
- basic knowledge on immunological, biological, physiological and pathological aspects of parasitic diseases caused by protozoan, helminths, arthropods and fungi/yeasts.
- basic knowledge on morphological, biochemical and epidemiological aspects on protozan and metazoan parasites.
- deep applied theoretical and practical knowledge on diagnosis, prophylaxis and control of animal parasitic diseases and zoonotic parasitosis.
- theoretical and practical knowledge on all biomolecular aspects and biotechnology applied to parasites and parasitic diseases.

Programme:
Protozoan-caused diseases: Trypanosomosis, Leishmaniosis, Toxoplasmosis, Neosporosis, Examitosis, Trichomonosis, Histomonosis, Coccidiosis, Giardiosis, Cryptosporidiosis, Sarcocystosis, Babesiosis, Theileriosis
Trematodes-caused diseases: Fasciolosis, Dicrocoeliosis, Schistosomosis, dog and cat liver trematodosis, gastrointestinal ruminant trematodosis.
Diseases caused by adult and larval tapeworms
Nematodes-caused diseases: Ascaridosis, Ancylostomosis, Uncinariosis, Pinworm infection, Heterakiosis, Lungworm infection of pets and livestock, gastrointestinal and intestinal Strongylosis, Angyostrongilosis, Spirocercosis, Trichuriosis, Filariosis, Habronemosis, Thelaziosis, Trichinellosis.
Arthropods-caused diseases: infections by ticks, mites, fleas, lice and flies (myasis).
Pentastomides-caused diseases: Linguatulosis
Infection by fungi/yeasts of pets and livestock
Host-Parasite Relationships: immunology, host's reaction, parasites ways of immunological escaping.
Parasitosis control: control programs, pilot control programs, disinfection, chemotherapy, immuno-prophylaxis, vaccination, anthelmintic resistance.

I.C. EPIDEMIOLOGY AND INFECTIOUS DISEASES OF ANIMALS

Teachers: Fulvio Marsilio; Cristina E. Di Francesco

Objectives of the course:
Fundamental knowledges about aetiology, epidemiology, pathogenesis, diagnosis, prophylaxis and control of the diseases argument of the program.

Programme:
The scope of epidemiology: definitions and general principles. Endemic, epidemic, pandemic and sporadic occurrence of diseases. The causes of diseases: Koch's and Evans' postulates; variables and types of association; causal models; formulating a causal hypothesis. Describing disease occurrence: measures of disease occurence. Determinants of disease: interaction host – agent - environment. The transmission of diseases: Types of host; factors associated with the spread and maintenance of infection. Epidemiological surveys: census and sampling. The nature of data: classification and representation of data. Observational studies: cohort, case – control and cross – sectional studies. Measures of association. Demonstrating of association. Evaluation of diagnostic tests: sensitivity and specificity; predictive value; multiple testing.
Rabies. Aujeszky's disease. Transmissible spongiform encephalopathies (Scrapie, BSE). Tetanus. Botulism. Anthrax. Ruminants clostridiosis. Respiratory infections of the cattle. Ruminants tubercolosis. Enzootic bovine leukemia. Brucellosis. Ruminants pestivirosis. Feline upper respiratory tract diseases. Feline retrovirosis. Feline panleukopenia. Canine enteric viral infections: parvovirosis, coronavirosis. Canine distemper. Canine adenovirus infections. Canine leptospirosis.

I.C. VETERINARY MEDICAL AND SURGICAL SEMEIOTIC

Teachers: Andrea Boari, Massimo Mariscoli

Objectives of the course:
The Course includes two integrated modules that enable the under-graduated student to learn the semiological method based on clinical observation including interviewing clients, taking the history and performing a complete physical examination either of small animals, horses and ruminants.
By means of factual correlation between functional anatomy and clinical procedures, the student learns how to examine all body systems or organs of the patient and identify the clinical abnormalities. Furthermore the student learns how to develop a problem list based on the understanding of pathological mechanisms of the observed problems and finally to establish a list of differential diagnosis using the problem-oriented approach.
The fundamentals of a complete systematic clinical examination is provided to every student by means of lectures and either practical or supervised work.

Programme:
Veterinary Medical Semeiotic
The classical scheme of general clinical examination based on direct tests such as inspection, palpation, percussion and auscultation, appropriately revised, up-dated and integrated with the newer collateral diagnostic procedures are presented and interactively discussed. Furthermore the

clinical examination of different systems including GI tract, cardio-circulatory, respiratory, urinary, tegumentary and hemo-lymphopoietic system is also illustrated. At the end of the course the student must be confident with the clinical examination, be able to recognize clinical abnormalities and to list differential diagnosis as well as further collateral diagnostic procedures.

Veterinary Surgical Semeiotic

The course is made-up of theoretic and practical lectures that allow the students to learn how to perform and interpret the clinical examination of the muscular-skeletal system, nervous system and the visual and auditory systems. The clinical examination is performed on clinical cases and the some tutorial or supervised work is performed mainly with help of videos on different clinical cases. After taking confidence with the clinical method the student learn how to localize a lesion or a functional problem following a logical approach, how to list differential diagnosis and how to chose further diagnostic procedures.

I.C. VETERINARY DIAGNOSTIC IMAGING AND LABORATORY MEDICINE

Teachers: Carlo Guglielmini; Morena Di Tommaso.

Programme:

Radiology: Radiation physics Basic properties of x-rays. The X-ray tube. Making of a radiographic image (cassettes, screens, x-ray films, grids) and film processing. Radiographic negative and positive contrast media (Iodinated and barium compounds). Radiation protection. Radiographic positioning of small and large animals. Visual perception and radiografic interpretation. Normal and pathological findings of the axial and appendicular skeleton in small and large animals. Radiographic examination of the neck and thorax: the larynx, trachea and esophagus; the thoracic wall and the diaphragm, mediastinum and pleural space; the heart, great vessels and the pulmonary vasculature; the lung. Radiographic examination of small animals abdomen: the peritoneal space; the liver and spleen; the kidneys and urinary bladder; the prostate gland and uterus; the stomach, small and large bowel; Contrastografic procedures of the gastrointestinal tract and urinary system;

Basic physical principles of computed tomography, magnetic resonance imaging and scintigraphy.

Diagnostic ultrasound: Basic ultrasuond physics. Wavelength, travel frequency and velocity of ultrasound waves. Transducers. Echo display modes: A-mode, B-mode, M-mode, realtime B-mode. Ultrasound interations with tissues. Image orientation, interpretation and termonology.

Doppler ultrasonography: basic physics, spectral and colour flow Doppler.

Clinical applications of ultrasuonds in small and large animals. Abdomen: liver, spleen, stomach, bowel, kidney, urinary bladder, prostate gland, mesenteric lymph nodes and abdominal vessels. Heart: normal echocardiography.

Endoscopy: rigid and flexible endoscopy (fiberoptic endoscope, video endoscope). Respiratory endoscopy. Gasrtointestinal endoscopy (esophago-gastro-duodenoscopy, colonscopy).

Laboratory procedures and clinical laboratory test: Basic devices and procedures for clinical laboratory methods. Laboratory safety. The complete blood count: morphologic and quantitative abnormalities of erytrocytes, leukocytes and platelets. Laboratory evaluations of commonly haemostatic disorders. Clinical chemistry: principal serum electrolytes, enzymes and products of metabolism for evaluation of injury and function of main organs. Electrophoresis of serum protein. Urinalysis: physical, chemical and microscopic

examination, urine protein: creatinine ratio. Examination of cavity effusions (pleural, abdominal and pericardial).

I.C. VETERINARY SURGICAL PATHOLOGY AND SURGICAL METHODS

Teacher: Lucio Petrizzi

Objectives of the course:
Give to the student of the third year a basic knowledge of the nature and ethiopathogenesis of the main diseases of surgical interest, their classification, healing patterns of lesions in different tissues and healing disturbances. During the methodology lectures the student will be given knowledge of basic surgical diagnostic and therapeutic techniques and main principles to follow during surgery.

Programme:
Death, necrosis. Gangrene. Anaplasia. Metaplasia. Aplasia. Atrophy. Hypertrophy. Dystrophy.
Inflammation, regeneration, wound healing, scarring and scar, disturbances of soft tissue healing.
Chronic wounds, ulcers, fistulas, caries.
Thrombosis, embolism, metastasis.
Infiltrations, tumours, cysts.
Atresia, stenosis, occlusions, adherences, adhesions, ankylosis, contractures.
Retentions, pathologic emissions, collections, ectasis.
Dismorphosis, dysfunctions, paralysis and paresis, lameness.
Heterotopy, ectopy, paratopies.
Traumatic lesions, compressions, contusions, wounds, ruptures, fractures.
Ethiopathogenesis of some important diseases of domestic mammals
The surgical unit: space distribution and overall organization
Asepsis e antisepsis.
Surgical instruments and devices. Sterilization.
Animal handling and restrain.
Clinical evaluation of surgical patients.
Preparation of patient, surgical field, surgeon and assistants.
Delivery of therapies.
Dieresis, exeresis, centesis, catheterism. Haemostasis. Drainages. Dressings
Suture materials and patterns. Stomies ed anastomosis.

I.C. ANIMAL BREEDING AND ECONOMICS OF LIVESTOCK PRODUCTION

Teachers: Melania Giammarco; Andrea Bonfiglio.

Objectives of the course:
The integrated course “Animal breeding and economics” consists of Animal breeding and genetics and economics of livestock production courses. Animal breeding and genetics strives to present a balance between topics in animal genetics and animal breeding (the application of the principles of animal genetics with the goal of genetically improving farm animals). The course is designed to enhance the knowledge of genetic principles and their applications on

genetic improvement of livestock populations. The course “Economics of livestock production” gives theoretic and basic instruments for correct management of a livestock farm and for a study of the market of livestock products and the relevant European and national policies.

Programme:
Animal Breeding and Genetics. Review of Basic Principles of Mendelian Inheritance. Cellular aspects of genetics. Qualitative inheritance. Exceptions to Mendel's Ratios. Genetic and Phenotypic Variation. Inheritance of quantitative traits. Heredity and environment. Principles of Selection. Selection in populations. Heritability and repeatability. Selection differential. Generation interval. Genetic Evaluation. Breeding value and genetic prediction. Breeding measures (performance test, progeny testing, pedigree testing, animal model). Breeding values and indices applied to selection in the various populations. Methodology of the mixed model for the evaluation of breeders (BLUP). Mating Systems. Selection methods. Inbreeding. Effects of inbreeding. Linebreeding. Outbreeding / crossbreeding. Heterosis. Systems of crossbreeding. Physiology of growth and development. Meat production. Physiology of lactation. Milk production. Reproduction according to species. Large ruminants. Small ruminants. Pigs. Horses
Economics of Livestock Production. 1) Some concepts of economic theory. Definition of economics. Economics of livestock: zoo-economics. Economic subjects and their relationships. Economic subjects and government forms. Some concepts of firm theory. Maximizing profits. Perfect competition. Technical knowledge. Production functions in the short-term. Production functions in the long-term. Production costs. Classifying production costs. Variable costs: total and average costs. Fixed costs: total and average costs. Total costs and total average costs. Marginal costs. Average costs in the long-term. Economies of scale. Diseconomies of scale.2) The characteristics of livestock farms. . Differences between farms and “agricultural enterprises”. Characteristics of livestock activity. Classifying livestock farms. Factors of production. Capital. Evaluating capital factor. Depreciation of capital assets. Livestock depreciation. Economic evaluation of livestock. Evaluating the overall quantity of animals in a farm. The amount of maintainable livestock. Stock products for livestock. Labour in a livestock farm. Manual workers. Intellectual workers. Classifying farms by factors of production. 3) Assessing economic, financial and asset management in a livestock farm. The balance sheet. Types of balance sheets and stakeholders. Balance sheet analysis. Reclassifying a balance sheet. The different management activities of a firm. Marketable production and gross profit of a stall. Economic account and asset account. Share analysis. Effectiveness analysis. Economic ratios. Economic ratio chains. Income ratios. Financial leverage. Chains of ROE and ROI. Financial ratios. Financial cycle ratios. The ROE tree. 4) The planning in a livestock farm. . The meaning of planning. The phases of a planning process. Planning and entrepreneurial attitude. Programming-control loop. Typologies of planning. Planning tools. Short-term strategies. The objective of farmers. Constructing a production process file. Defining a programming model. The constraints of a programming model. Solving a programming model. Balance sheet simulation. Linear programming. The economics of feeding animals. Optimal choice of a food portion. Feeding dairy cows. Feeding beef cattle. Feeding techniques. Break-even point analysis. Long-term strategies. Make or buy analysis. Choosing between two machines. Choosing between manual or mechanical product collection. Choosing between selling raw products or processing products. Cost-benefit analysis. Comparison between investments. Land improvements analysis. Financial analysis related to investments. 5) The market of livestock products. The meaning of a market of livestock products. Demand of livestock products. The demand curve. Demand factors. Elasticity of demand. Elasticity of demand of livestock products. Supply of livestock products. The supply curve. The market balance. Elasticity of supply. Prices of livestock

products. The common agricultural policy. The common market organisations (CMOs). Classifying the CMOs. European and national support to meat and bovines. The single payment scheme. The agro-food industry. The size of the agro-food industry. Income distribution within the agro-food industry. The agro-food chain. Size structure of the agro-food system. Value creation and firm size. Food safety. Instruments for food risk management. Ex-ante instruments for food risk management. Ex-post instruments for food risk management. Food safety policy in the European union. Worldwide distribution of BSE. The traceability system. The bovine meat chain: the cattle feeding industry. The bovine meat chain: livestock. The bovine meat chain: slaughtering. The bovine meat chain: trade. The bovine meat chain: consumption. Export and import of meat and bovines. Tendencies and future scenarios. EU orientation. International scenarios. Consumers' preferences. Chain relationships. Sector prospects and market strategies.

FOURTH YEAR

I.C. VETERINARY SURGICAL CLINIC

Teachers: Aurelio Muttini, Amedeo Cuomo

Objectives of the course
Improve the student skill in the approach and treatment of surgical diseases with particular regard to dog, cat and horse.

Programme
Large animals. Semeiotic, diagnosis and differential diagnosis, prognosis and therapy of the most important diseases of the respiratory system of the horse. Diseases of superior and inferior respiratory tract. Diseases of the guttural pouch. Endoscopies, treadmill endoscopies. Semeiotic, diagnosis and differential diagnosis, prognosis and therapy of the most important diseases of the locomotory system of the horse. Diseases of the fore and hind leg. Lameness and their characteristics. Diagnostic anaesthesia. Diagnosis by radiology and ultrasound. Scintigraphy. Arthroscopy. Myopathy. Tendonitis. Podology and ferriery concepts. Poor performance syndrome: definition and clinical diagnosis. Colic syndrome. Colic signs and therapeutic decisions. Semeiotic, diagnosis and differential diagnosis, prognosis and therapy of the most important diseases of the digestive system. Semeiotic, diagnosis and differential diagnosis, prognosis and therapy of the most important diseases of the urogenital system. Laparoscopy. Surgery of bovine.
Small animals. Approach to the traumatized patient. Reconstructive surgery of soft tissue and skin. Traumatic fractures treatment. Hernias and body cavities discontinuation. Approach to diagnostic and surgical treatment of the most important pathology in: Respiratory system; Gastrointestinal system; Urinary system; Musculoskeletal apparatus; Ear, eye and annexes; Endocrine system.

I.C. VETERINARY ANAESTHESIOLOGY AND SURGICAL TECNIQUES

Teachers: Aurelio Muttini, Amedeo Cuomo.

Objectives of the course
Give to the student a basic practical and theoretical knowledge of anaesthetic approach to the patient of different species.

Programme:
Anaesthesia definition, components and physiologic basis. Pain: evaluation and its treatment. Applied pharmacology of anaesthetic drugs. The patient: preanesthetic evaluation. Strumental monitoring and clinical measurement. Sedation, premedication and analgesia. Techniques in anaesthesia. Delivery devices machine for intravenous anaesthesia and theoretical principle. Machines and circuits for inhalatory anaesthesia. Local anaesthesia. Anaesthesia in the species. Anaesthesia for special surgery. Emergency and complication of anaesthesia: prevention and treatment.
Surgical techniques. How to make the good choice. Surgical techniques in emergency medicine. Dieresis. Biomechanics of soft tissues. Halstead principles. Wound surgery. Anastomosis. Antisepsis. Dieresis and synthesis in specialist surgery.

I.C. OBSTETRICS, PATHOPHYSIOLOGY OF REPRODUCTION AND ARTIFICIAL INSEMINATION

Teachers: Augusto Carluccio; Pasqualino Loi; Fausto Cairoli.

Programme:
Physiology of reproduction in the male of domestic species; Physiology of Reproduction in the female of the domestic species. Gametes maturation, fertilization and embryonic development in mammals. Implantation and pregnancy. Control of the reproductive activity with a particular focus on the ovine species. Semen technology, AI, superovulation and Embryo transfer, embryo biotechnologies: sexing, in vitro embryo production , embryo freezing, cloning, transgenesys.
Practical courses: estrus synchronization, superovulation, embryo recovery and transfer, laboratory activity on in vitro embryo production, embryo handling and micromanipulation.
Obstetrics: Importance and aims of obstetrics, comparative anatomy of the genital female tract in different domestic species, estrus cycle in domestic animals, fertilisation and embryonic attachment, development of fetal membranes and placentation. Physiology of the gestation period; shape and location of the pregnant uterus; number and position of the fetus/es in the uterus; length of pregnancy; hormonal control of gestation ; -Diseases and accidents during the gestation period; abortion; fetal mummification and maceration; extrauterine pregnancies; dropsy of the fetus and fetal membranes; hysterocele; torsion of the uterus; vagino-cervical prolapse; -Parturition; symptoms of approching parturition; endocrinolgy of parturition; stages of parturition; - Dystocia; common forms of dystocia in domestic animals; - Obstetrical operations; mutation; forced extraction; fetotomy; cesarean section; - Puerperal period; involution of uterus; - Injuries and diseases of the puerperal period; postpartum hemorragie; lacerations and contusions of the birth canal; uterine prolapse; metabolic diseases; postparturient infections and diseases; postpartum paraplegia
Pathology of animal reproduction: infertility in domestic animals. abnormal estrus cycle, failure to observe oestrus, anoestrus. Pathological conditions of reproductive tract that cause infertility. Embryonic and fetal loss, fetal mummification. Pathologies of the fetus, placenta and fetal membranes. Abortion. Reteined fetal membranes. Vaginal and uterine prolapse, incidental diseases to parturition. Uterine torsion. Puerperal diseases. Pseudopregnancy. Genital and mammari neoplasia.
Artificial insemination: advantages of the artificial insemination. Reproductive examination of the male. Techniques and instruments for semen collection and artificial insemination. Evaluation, handling and storage of semen (cooled and cryopreservad semen). Technologies for embryo transfer in domestic animals.

I.C. INSPECTION AND CONTROL OF FOOD OF ANIMAL ORIGIN: PRIMARY PRODUCTS

Teachers: A. Vergara; P. Visciano

Objectives of the course: students must acquire the ability of identifying and analysing the quality and the possible alterations of primary products (meat, milk, fishery products, eggs, honey) in order to express correct judgments in relationship to the national and EC rules.

Programme: the new EC rules on the hygiene of foodstuffs and the official controls on products of animal origin: Regulation (EC) No 178/2002; Regulations (EC) No 852/2004;

Regulation (EC) No 853/2004; Regulation (EC) No 854/2004; Regulation (EC) No 882/2004. "Primary products". Pre-harvest quality management (good farming practices). Food hygiene, food related safety (good hygiene practices). Principles, concepts and methods of risk-analysis. Principles, concepts and methods of HACCP. The application of hazard analysis and critical control point (HACCP) principles to primary production. Prevention and control of food-borne hazards related to human health; environmental issues related to food production (including waste management). Animal welfare at the level of production, transport and slaughter. Slaughterhouse organisation and slaughtering phases. Tasks of the official veterinarian in slaughterhouses, game handling establishments and cutting plants placing fresh meat on the market: food chain information, ante-mortem examination, animal welfare, post-mortem inspection, specified risk material and other animal by-products, laboratory testing. Meat declared unfit for human consumption: patho-physiological abnormalities or changes, faecal and other contaminations, residues or contaminants, microbiological criteria. Specific hazards. Emergency slaughter. Health marking. Fresh meat from bovine, sheep and goats, solipeds, swine, poultry, farmed game, farmed lagomorphs, wild game. Minced meat, meat preparations and meat products. Drill-lessons and practical demonstrations are organized in different slaughterhouses and in the Faculty's anatomical room on inspection techniques, on identification of animal species by examination of typical parts of the animal, and on identifying and commenting on parts of slaughtered animals in which changes have occurred.
Live bivalve molluscs: official controls on the production and placing on the market of live bivalve molluscs, live echinoderms, live tunicates and live marine gastropods .
Fishery products: official controls on the production and placing on the market of fresh fishery products: organoleptic examination, freshness indicators, histamine, residues and contaminants, microbiological checks, parasites, poisonous fishery products. Great importance is given to the practical identification of the species most frequently recovered in the market and to fraud aspects.
Milk production: official controls on animals involved in milk production; health requirements for raw milk production, health status of the animals and use of veterinary medicinal products. Official controls on milk production holdings: hygiene requirements, inspections and monitoring.
Eggs: official controls on the production and placing on the market of eggs. Drill-lessons are organised in Packing centres, in order to show how eggs are graded by quality and weight.
Frogs' legs and snails: official controls on the production and placing on the market.
Honey and other hive products: official controls on the production and placing on the market.
Chilling and freezing techniques in food storage
Packaging under vacuum and in modified atmosphere

I.C. INFECTIOUS DISEASES, PROPHYLAXIS AND ANIMAL HEALTH II

Teacher: Fulvio Marsilio

Objectives of the course:
Fundamental knowledge about aetiology, epidemiology, pathogenesis, diagnosis, prophylaxis and control of the diseases argument of the program.

Programme:
Fundamental of pathogenesis, diagnosis and prophylaxis of infectious diseases.
Foot and mouth disease. Swine vesicular diseases. Classical and african swine fever diseases. Swine flu. Swine micoplasmosis. Swine erysipela. Swine athrofic disease. Contagious bovine

pleuropneumonia . Equine respiratory diseases. Equine infectious anemia. Glanders. Contagious agalactia. Poxvirus infections: Sheep pox, Contagious ectima. Ovine and caprine retrovirosis: visna-maedi, caprine arthritis-encephalopathy. Blue tongue. Malignant catharral fever. Ruminants mastitis. Ruminants chlamydiosis. Canine ehrlichiosis and rickettsiosis. Salmonellosis.

I.C. VETERINARY INTERNAL MEDICINE AND VETERINARY FORENSIC MEDICINE

Teachers: Carlo Guglielmini; Tonino Talone

Programme:
The respiratory system: diseases of the nasal cavity, pharynx, larynx, trachea, airways, lungs, pleura, mediastinum, and diaphragm.
The cardiovascular system: congenital heart diseases, cardiac arrhythmias, diseases of the pericardium, myocardium, endocardium and vascular vessels, heart failure.
The haemotopoietic system (anaemia and leukaemia) and haemostatic disorders.
The gastrointestinal system: diseases of the oral cavity, pharynx, esophagus, stomach, prestomachs, intestine, peritoneum, liver and pancreas, colic in horse.
The musculoskeletal system: bone and muscular diseases.
The urinary system: diseases of the kidneys, ureters, bladder and urethra, renal failure.
The endocrine system: diseases of the pituitary gland , thyroid, adrenal glands and endocrine pancreas.
The tegumentery system: parasitic, bacterial, allergic diseases of the skin.
The central nervous system: most common CNS diseases.
Metabolic dieases: ketosis, tetany and hypocalcemia.
European and national legislature. Italian health organization. Veterinary public health. Veterinary pharmacopea. National laws for animal experiments and welfare and stray animal. Legislation for animal productions, breeding and import/export movements. Deontological codex.

I.C. ANIMAL PRODUCTION

Teacher: Lamberto Lambertini

Objectives of the course:
Objective of the course is to introduce students and develop an understanding of: husbandry techniques of the main livestock species; farm environment and farming environmental impact; microclimatic conditions and its effects on the farm systems; disinfesting and deratting techniques. At the end of the course, students should be able to recognize a good farm characteristic and to give the instruction to the breeders to prevent problems and improve production. The course is articulated in two different parts: animal production hygiene and husbandry technology. The course is supported by different farm visits.
Programme:
Animal production hygiene. Different environmental factors and their influence on animal performance and quality of animal products. Microclimatic control in the farm (wind, temperature, humidity). Milking practices and hygiene. Milk collection and storage. Milk quality requirements. Manure management: depuration, spreading and effect of the diet on manure characteristic. Solution to reduce pollution from swine sewer sludge. Disinfectants

and disinfestations: general information, classifications and characteristic of the most important products. The insect's struggle and rodent control in the farm.
Husbandry technology. Dairy production: dairy breeds; Italian and European situation; calf care and weaning; heifers breeding; high yield dairy cows: management throughout different production phases; dairy farm facilities; automatic milking procedures; feeding and nutrition strategy. Beef productions: beef cattle breeds; farming system for young bulls and veal husbandry. Swine production: main breeds and hybrids reared in Italy; reproduction and growing finishing pigs management; housing and feeding of swine; carcass and meat quality. Rabbit breeding: scenario of international and Italian rabbit production: profitability and diffusion; rabbit farming: weaning, growing and reproduction; basic feeding and nutrition management.

I.C. AVIAN ANATOMY AND HUSBANDRY AND POULTRY DISEASES

Teachers: PierAugusto Scapolo; Giuseppe Martino; Cristina Di Francesco

Objectives of the course:
The course provide the fundamental knowledge about the most common poultry diseases together with knowledges of the structure/function of major organ systems and poultry processing. The course consists of lectures and necroscopic examinations but also guided visit to poultry stock farm are performed.

Programme:
Introduction to anatomical and histological terms. The structure of avian skin and feathers
Skeletal system including appendicular and axial skeletons. Myology and arthrology of chick.
Anatomy and histology of the following systems:
Digestive system
Respiratory system and air sacs
Cardiovascular and lymphatic systems
Urinary system
Male and female reproductive systems.
Poultry Italian and European economic importance (statistical data). Italian poultry trade organization. Artificial incubation: general characteristics of incubators. Sheds: general characteristics, ventilation, lightning. Breeding systems of poultry categories. Forced moult. Eggs production. Eggs chemical and nutritional characteristics. Factors affecting egg quality. Turkeys breeding. Poultry meats chemical and nutritional characteristics. Factors affecting poultry meat quality. Poultry Feed classification. Additives used in Poultry feeding. Formulation examples of balanced diets.
Fundamental knowledge about aetiology, epidemiology, pathogenesis, diagnosis, prophylaxis and control of the poultry diseases. Principles of disease prevention: washing and disinfecting of buildings; vaccination. Salmonella infections; Chlamydiosis; Colibacillosis; Fowl Cholera; Infectious Coryza; Mycoplasmosis. Newcastle disease; Infectious Bursal Disease; Chicken Infectious Anemia; Infectious Bronchitis; Influenza; Adenovirus infections; Avian Encephalomyelitis; Infectious Laringotracheitis; Poxvirus infections; Neoplastic diseases: Marek’s disease; Leukosis / Sarcoma group. Coccidiosis.

I.C. ANIMAL FEEDING AND NUTRITION

Teacher: Alessandro Gramenzi

Objectives of the course:
Animal Nutrition deals with classification and function of nutrients, digestive processes, characterization of feedstuffs, and formulation of diets for domestic animals. In this course, will be considered all aspects of nutrition for domestic animals, from fundamentals of nutrition through feeds and feeding. Students will learn about nutrients, digestive systems, feeds, ration balancing and livestock feeding. The principles apply to all mammalian but will be applied especially to beef cattle, dairy cattle, sheep, swine and horses. Will be emphasized the relationship between nutrition, livestock production quality and animal health. There will be an exposure to computerized ration balancing techniques, in addition to the principles of ration formulation by hand methods.

Programme:
Introductions, Introduction to course, Expectations
History of Nutrition; Composition of Plants (animal food) vs. Animals
Nutrient Classes
Water
Carbohydrates, (definitions, classifications, functions, deficiencies, etc.)
Fat, (definitions, classifications, functions, deficiencies, etc.)
Proteins, (definitions, classifications, functions, deficiencies, etc.)
Vitamins, Vitamins A, D, E, K (definitions, classifications, functions, deficiencies, etc.)
B-Vitamins, (definitions, classifications, functions, deficiencies, etc.)
Minerals, Introduction; Required;
Macro Minerals
Trace Minerals
Ultra Trace Minerals
Non-nutritive feed additives, growth promotants
Mycotoxin contamination of feedstuffs
Digestive anatomy and secretions, physiology; pigs
Ruminant and Herbivore anatomy and function. Fermentation.
Feedstuff analysis and evaluation.
Energetics. TDN, GE, DE, ME, Net E. Value of Protein (BV, NPU, N Dig., N Reten.)
Feed production and classification
Concentrates: cereal grains, by-product feeds.
Concentrates: protein feeds, miscellaneous.
Balancing rations, Principles, Non-ruminant applications. Method applied to some ruminant rations.
Forages: Grasses, Legumes, Residue feeds
Forage Intake and Factors affecting Dry Matter Intake (i.e., Feed Consumption)
Forages: harvest forms; pasture, hay, silage.
Ration balancing with Forages
Balancing rations with the aid of Computers
Feeding Beef Cattle
Feeding Dairy Cattle
Feeding Sheep
Feeding Swine
Special things about the nutrition of pets.

FIFTH YEAR

I.C. VETERINARY MEDICAL CLINIC AND THERAPY

Teacher: Andrea Boari

Objectives of the course:
Students will learn to methodically solve clinical problems. They will develop skills necessary for collection of clinical data and will develop clinical reasoning and problem solving skills. In order to pass this course, students must work independently to solve problems and/or take care of clinical cases and/or answer clinically relevant questions with or without reference material within a time frame defined by the instructor.

Programme:
This is an internal medicine and therapeutic interactive/discussion course which involves homework, pop tests, scheduled tests and solving clinical cases of internal medicine. The scope of the course may include any medical problem that occurs in dogs, cats, horses, and cattle. The specific content of the course typically varies from year to year. Part of the clinical cases come from hospitalized animals and students learn how to approach a clinical case starting from the correct interview with the owner, going through physical examination and, then, through optimal diagnostic and therapeutic steps.
1) The student will learn to solve clinical problems with a logical and methodical approach, as opposed to using memory and "pattern recognition". This methodical path includes a) defining problems at their highest possible level, b) determining the possible rule outs (i.e., differential diagnoses), c) determining which of the possible differentials are most likely based upon the available data, and d) determining the optimal diagnostic and/or therapeutic plan based on the previous assessment.
2) The student will learn to use existing texts and/or library facilities to solve clinical problems.
3) Students will come to understand various clinical problems so that they a) can readily distinguish between problems that mimic one another, b) know and understand the categories of diseases that produce a particular problem and how to distinguish between these categories, c) know the specific diseases that cause each category mentioned in 3b, and d) know and understand the tests needed to distinguish between the various diseases. Ultimately, they will be able to choose the right treatment based on the presumptive diagnosis and/or to correct or control severe clinical signs.

I.C. VETERINARY OBSTETRICAL CLINIC

Teacher: Augusto Carluccio

Objectives of the course:
The student must demonstrate his ability to a clinical approach to theriogenology problems. Furthermore, he need to know the causes of infertility and to formulate a diagnosis, prognosis and therapy, and to use specific and appropriate drugs. He must demonstrate the knowledge of the reproductive laws. He need to know the principle techniques for manipulation of estrus cycle, for artificial insemination and embryo transfer in farm animals. Finally he must demonstrate the knowledge of the main surgical techniques in animal reproduction.

Programme: Animal contention in theriogenology; Reproductive anamnesis; Clinical evaluation of the reproductive patient; Use of laboratory and collateral diagnosis; Diagnosis of pregnancy in domestic animals; Diagnosis and therapy of the most important causes of female infertility; Anestesiological approach in theriogenology; Surgery in animal reprodiction; Clinical aspects and therapy of postartum diseases; Use of the drugs used in theriogenology; Manipulation of estrus cycle; Diagnosis and therapy of the disease in animal neonatology; Clinical approach to the mammary diseases.

IC INSPECTION AND CONTROL OF FOOD OF ANIMAL ORIGIN: PROCESSED PRODUCTS

Teachers: A. Ianieri; A. Vergara

Objectives of the course: students must learn the processes involved in the safe production of food, and the veterinary involvement. They must acquire the ability of identifying and analysing the quality and the possible alterations of processed products in order to express correct judgments in all the steps of food chain (production, sale and use by the final consumer), in relationship to the national and EC rules.

Programme: food processing and food technology: strategies for food preservation. Heat treatment. Irradiation. Drying and reducing of water activity. Control of pH and use of organic acids. The use of chemical preservatives: sulfite and nitrite. The effect of redox potential. New and emerging physical methods of preservation. Use of combined preservative factors. Microbial ecology of different types of food: processed meat products, fermented meats, processed fishery products, dairy products, fermented milk products, egg products. The HACCP-based approach in the different typologies of food industries: the food business operators' obligations and the hygiene requirements. Principles, concepts and methods of good manufacturing practice and quality management. Health and safety checks for proper handling, storage and preparation of foods, adequate refrigeration temperatures, proper cleaning and sanitizing of utensils, work areas and equipment, prevention of cross-contamination. Principles of training of personnel working in food industry. Drill-lessons are organised in this step. Students are divided in groups and are invited to write detailed flow-diagrams for the most known food products and to put in place the requested procedures based on hazard analysis and critical control point (HACCP).
Population dynamics of infection and intoxication. Diagnostic epidemiology. Monitoring and surveillance systems. Principles and diagnostic applications of modern testing methods. Investigations of outbreaks of food-borne diseases in humans. Food-borne pathogens: *Bacillus* spp., *Campylobacter*, *Clostridium botulinum*, *Clostridium perfringens*, *Escherichia coli*, *Listeria monocytogenes*, *Salmonella*, *Shigella* spp., *Staphylococcus aureus*, *Vibrio* spp., *Yersinia* spp., the *Aeromonas hydrophyla* group, protozoa, foodborne viruses, toxigenic fungi and mycotoxins. Precautionary principle and consumer concerns. Labelling and presentation of food addressed to the final consumer. Nutritional labelling. Traceability. Risk assessment, risk management and risk communication. Microbiological criteria for foodstuffs: Regulations (EC) No 2073/2005.
Examples of real cases will be supported by guided visits or documentation on food production and transformation plants. Drill-lessons on analytical and sensorial evaluation (microbiological and chemical tests) on foodstuffs of animal origin will be performed.

ANNEX 5.1

AGREEMENT FOR THE INTEGRATIVE TEACHING ACTIVITIES OF THE FACULTY OF VETERINARY MEDICINE AND FOR PRACTICAL TRAINING COURSES

BETWEEN

The University of Teramo, Faculty of Veterinary Medicine, located in Viale Crucioli no. 122, federal ID number 92012890676, hereinafter named "promoter subject" represented by the President of the Faculty of Veterinary Medicine, prof. Fulvio MARSILIO (Rector delegate according to D.R. no. 547 dated 09/30/2004), born in Bari on 12/20/1960

AND

…….., located in (city zip code), hereinafter named "hosting subject", represented by Mr…….., born in ……., on…….

Whereas

- That art. 27 of DPR 382/80 foresees: "University Rectors can stipulate conventions with public and private bodies, under proposals by the faculty, in order to use extra-university tooling and logistic services for integrative teaching activity performances, oriented to the completion of academic and professional training".

- That art. 8 of Law 341/90 provides for: "the fulfillment of study courses and cultural and training activities formerly mentioned in art. 6, according to the modalities defined by single location, the Universities can make use of the cooperation of public and private subjects, by having faculty to foresee the constitution of association, also under private law rules, and the stipulation of appropriate conventions".

- That the Teaching Regulation of the University approved with D.R. 151 dated 7/31/2001 foresees in art. 2, paragraph 3: "the University can organize, according to the rules in force and the present Regulation, further teaching and training activities also in cooperation with public and private bodies and subjects, both Italian and foreign".

- That it is the University's general interest to be able to employ extra-university competences and structures in order to ensure a better and more complete accomplishment of its own institutional tasks, in particular concerning the possibility to give students who are writing their thesis and that attend Specialization courses, Doctorate courses and University Masters, relevant specialist practice-theory experiences.

It is agreed and stipulated what follows:

Art. 1.
Purposes

The Faculty of Veterinary Medicine of the University of Teramo can use resources and structures external to the University, in particular in cooperation with the structure named …….., hereinafter named hosting subject, according to the modalities implied in the present Agreement, for the performance of teaching practical integrative activities in its School Courses, Specialization Schools, Doctorate Courses and University Masters, in order to integrate and execute professional knowledge and cultural training of the students and to experiment innovative teaching modalities by the participation to activities of practical-applied nature, as well as of activities of practical traineeship.

Art. 2.
Modalities for the carrying out of the integrative practical teaching activities
and those of internship activities

Modalities, performance time, number of students attending integrative practical teaching activities and internship activities will be object of a mutual consultation.

The responsibility of integrative practical teaching activities and internship activities is binding to the teacher or teachers of the Integrated Course or to the teacher responsible for the internships; they can make use of the competences of specialized professionals within the hosting subject.

The practical activities will be held according to the hygiene, security and health rules on job sites provided by the subject regulations in force.

Further activities carried out by students during the integrative practical teaching activities and internship do not constitute a job relationship with the hosting subject; neither can they be substitutive of company labor or professional efficiency. Compensation is not considered on behalf of the hosting subject for the fruition of company services for the student.

Art. 3
Insurance Coverage

The University of Teramo guarantees that the students who benefit from the integrative practical teaching activities and internship activities, also outside of the official lesson schedule, are covered by an insurance policy (workers compensation) in case of injury suffered during the activities mentioned in this agreement, as well as for civil responsibility (liability insurance) for injuries to third parties (people and/or goods) against their will during the abovementioned activities.

The workers compensation policy is currently stipulated with ASSITALIA Assicurazioni – branch of Teramo.

The liability insurance policy is stipulated with FONDIARIA Assicurazioni – Branch of Teramo.

The student's commute back and forth from the premises of the hosting subject are excluded from the insurance policy, unless authorized vehicle by the University of Teramo, provided by the same insurance policy.

The insurance coverage for employees of the hosting structure is the responsibility of the hosting subject, as well as of the rooms and infrastructures put on hand for the integrative practical teaching activities.

Art. 4
Costs

It is recognized that the implementation of the given agreement will not garner, on behalf of all parties, any financial duty to one another.

Art. 5
Terms

The given agreement will enter into force starting from the date of subscription for the duration of one year.
The agreement will be wordlessly renewed from year to year, unless written disregard from one of the parties to be communicated within two months of the deadline by certified mail.
It is understood that, also in case of withdrawal, the fulfillment of activities in course will be granted, until the end of the teaching semester.

Art. 6
Efficacy

The given agreement is binding for the parties according to the laws, which dispose the execution.

Art. 7
Controversy

The parties bounded with the given agreement accept to define in a friendly manner any controversy that may arise from the activity which is object of the given agreement and, in the case being impossible to achieve an agreement in this way, any eventual dispute should be resolved by ritual arbitrate according to Art. 806 and following the code of civil procedure with a board of arbitrators composed of three arbiters. Each of them is nominated by one of the three parties; the President of the board of arbitrators is named by his/her own members, and in the case of disagreement or missed nomination of the President on behalf of one of the parties, the he/she is nominated by the President of the Court of Teramo, being this the town where the board of arbitrators is located.

Art. 8
Final provisions

As regards what is not expressly disposed of in the given agreement, the parties defer to what is provided for in the matter regulations in force.

Read, approved and undersigned.
Teramo, _____

The Dean of the Faculty of Veterinary Medicine
University of Teramo
Prof. Fulvio MARSILIO

_____

The Legal Representative of …….
Dr. …….

_____

ANNEX 5.2

UNIVERSITY OF TERAMO

Evaluation Nucleus (NUVA) Report - Faculty of Veterinary Medicine
Academic year 2005-2006

Section A:

A1: Coverage degree of surveying
Eightythree out of 93 (89,25%) courses held by the Faculty of Veterinary Medicine during the academic year 2005-2006 have been surveyed by means of 2569 student's questionnaires. The ratio between the number of questionnaires and the number of students (1101) is 2.33/student, the highest of our University. Moreover the covering index, near the 90% of the students, gives a high statistical value to the evaluation. To enter the school of veterinary medicine, a student must go through a university entrance examination that enhance his motivation in following the courses. Furthermore the attendance to all courses is mandatory and the presence of students is verified every lectures. Both the evidences can explain the higher participation of the students in the evaluation process of the Veterinary Medicine curriculum. The number of students (1101) results from the addition of the students of the School of Veterinary Medicine (718), of the curriculum Animal Health and Welfare, a school for veterinary technician/nurses (225) and two curricula dedicated to Biotechnology (136) and Biotechnology of Reproduction (22).

A2: Characteristic of the sample
Compare to the other Faculties of our university Veterinary Medicine has the higher rate of female students (68,8%) and the lower age of the students, 90.4% is under 25 y of age. Almost half of the students (46,5%) entering Veterinary Medicine come from "Liceo" specializing in scientific studies and the 18.2% from "Liceo" specializing in classical studies.

Section B: Evaluation of lecture or practical exercises rooms and teaching equipments

The student opinion about the adequacy of the lecture rooms, practical exercises rooms and the teaching equipments is moderately critical with respectively a degree of satisfaction of 73,1% (lecture rooms), 63,6% (practical exercises rooms) and 63,6% (teaching equipments). The degree of satisfaction is the lower compare to the other Faculty of the University which are lodged in convenient and proper new or renewed buildings. The student's opinion stresses their uneasiness regarding the structural inadequacy for practical and tutorial activity which is a fundament of the teaching process that cannot be set aside.

Section C: Study load and Curriculum organisation

The study load of each course is judged adequate by 75,2 % of the students and the majority of them (65,2%) consider adequate the overall time schedule of parallel courses within a semester. More critical is the student's opinion regarding the overall study load of the parallel courses within a semester that is adequate only for 45,7% of the students as well as the overall examination time schedule positive for the 45,4%.

Section D: Quality of the teaching activity and the examination system

78,6 % of the students is satisfied by the clear explanation of the examination procedures and criteria. A large majority (84,5%) of students judged adequate the teaching material (books, handouts etc..) recommended or supplied by the teacher, the 83,3% consider satisfactory the ability of the teacher explaining the different topics of the course and the 91,5% consider the teacher able to give exhaustive answer to any explanation request. All these parameters have the higher rate of the University. A positive evaluation of the ability to motivate the students (80,5%) and stimulating an active participation and interaction (79,3%) by the teacher were also assessed. To attend lectures (86,6%) and practical exercises (86,9%) is helpful for the students. Finally student demonstrate to be satisfied by the teacher's comply with the official lectures calendar (91,0%) and the teacher availability for questions or suggestions during consulting hours (88,2%).

Section E: Knowledge requested, overall degree of satisfaction

The 63,3% of the Veterinary Medicine students states to have preliminary knowledge sufficient to understand the topic of the courses (lowest rate of the University). On the other hand 84,4% of the students is interested to the courses. The overall degree of satisfaction is 75,4% for the Faculty of Veterinary Medicine and 78,9% for the school of Veterinary Medicine.

Section F: Final comments

As reported in the sections D and E the teaching quality at the School of Veterinary Medicine is appreciated by the student and judged largely adequate. Shadows are evident in the overall study load of the parallel courses within a semester as well as the overall examination time schedule judged negatively by the students (section C). Clear is also the uneasiness of the students regarding the inadequacy of the structures and equipment for practical and tutorial activity which is a fundament of the teaching process that cannot be set aside in a School of Veterinary Medicine.

ANNEX 5.3
Degree of satisfaction (%) processed from the forms distributed to the students during academic years 2003-2004, 2004-2005 2005-2006

Q #	Question's Text	AA 2003/2004	AA 2004/2005	AA 2005/2006
	Number of evaluated forms	1094	1617	1608
11	Is the required working load of this course acceptable?	62,3	69,6	73,0
16	Was the teacher on time at the lectures?	62,9	76,2	82,6
17	Are lectures topics faithful to the syllabus presented at the beginning of the course?	66,3	84,0	86,3
18	Are lectures interesting?	71,2	76,0	78,5
19	Are lectures useful to understand the scientific and professional value of the given knowledge?	70,6	79,6	81,3
20	Are the lectures useful to prepare for the examination?	67,8	80,6	83,5
21	Does the teacher use the teaching supports such as slides, videos, overhead projector etc.) adequately?	69,0	82,3	88,1
22	Has the teacher explained evaluation and examination procedures and criteria?	58,7	69,4	78,3
23	Is the teaching material (books, handouts etc..) recommended or supplied by the teacher adequate?	61,8	77,9	80,9
24	Is the teacher able to explain clearly the topics?	69,0	78,5	81,7
25	Is the amount of knowledge given during the course adequate?	64,3	76,1	78,9
26	Does the teacher motivate the students to learn the topics of the course?	63,9	75,7	80,0
27	Is the teacher available during consulting hours?	59,3	74,4	73,4
28	Does the teacher stimulate the interaction of students during lectures?	63,5	75,8	76,7
29	Gives the teacher exhaustive answer to any explanation request?	73,3	85,8	89,5
30	Does the teacher comply with the official lectures calendar?	70,3	84,7	88,3
31	Does the teacher comply with the lecture's length?	70,2	84,2	87,1
32	It's useful to take lectures of this corse?	66,2	79,0	83,5
33	Are the teaching activities such as practical exercises, seminars, tutorials, etc. useful?	62,4	72,5	68,6
34	Is the level of difficulty of practical exercises or tutorials adequate?	60,5	68,5	65,4
35	Gives the teaching staff during practical exercises or tutorials exhaustive answer to any explanation request?	58,1	68,8	65,4
36	Does the teaching staff comply with the official calendar of practical exercises or tutorials?	56,8	68,0	62,4
37	Does the teaching staff comply with the length of practical exercises or tutorials?	56,1	68,0	64,6
41	Overall I'm satisfied with this course	60,3	75,0	78,9

ANNEX 5.4
Form distributed to the students for the evaluation of teaching

University of Teramo

School of Veterinary Medicine

Name of the course ……

Teacher ……..

Please fill the following questionnaire using only the sheet for optical reading. Filling the questionnaire is optional. The questionnaire is designed to record your personal opinion on the different aspects of the teaching process. Your opinions will contribute to improve the teaching environment and quality. The questionnaire is anonymous and it will be processed only by the evaluation nucleus (NUVA) for statistical purpose.
If you do not know how to answer a question or a question is not applicable for the course concerned, you may skip the question. Do not write anything else on this side of the form.
At the end of questionnaire (observations) you can write further comments.

1)	Age of the	A) ≤ 20 y	B) 21-22 y	C) 23-24 y	D) 25-26 y	E) ≥ 27 y
2)	Sex	A) female	B) male			
3)	School of origin	A) "Liceo" classical studies	B) "Liceo" scientific studies	C) Technical secondary school	D) "Liceo" art subjects	E) land-surveyor
4)	School of origin	A) teacher's training school	B) commercial school	C) "Liceo" foreign languages	D) Other Italian secondary schools	E) Other foreign secondary schools
5)	Year of enrolment	A) 1st	B) 2nd	C) 3rd	D) 4th	E) 5th
6)	Year over the regular duration of curriculum (off-course – F.C.)	A) 1st FC	B) 2nd FC	C) 3rd FC	D) 4th FC	E) over the 4th FC
7)	Knowledge requested by the course :	A) I do not have these knowledge	B) The requested knowledge where not a topic of previous courses		C) The requested knowledge where a topic of previous courses but I didn't pass these examinations yet.	
8)	Are the lecture rooms adequate? (can you hear, can you see, can you sit?)	A) NO	B) NO>YES	C) YES>NO	D)YES	
9)	Are the practical exercise rooms (including tutorial and teaching laboratories) adequate?	A) NO	B) NO>YES	C) YES>NO	D)YES	
10)	Are the equipments for practical exercises are adequate?	A) NO	B) NO>YES	C) YES>NO	D)YES	
11)	Is the required working load of this course acceptable?	A) NO	B) NO>YES	C) YES>NO	D)YES	
12)	I'm following a recommended plan of studies	A) NO	B) NO>YES	C) YES>NO	D)YES	
13)	Is the overall study load of the parallel	A) NO	B) NO>YES	C) YES>NO	D)YES	

	courses acceptable?					
14)	Is the overall time schedule of the parallel courses acceptable?	A) NO	B) NO>YES	C) YES>NO	D)YES	
15)	Is the examination time schedule of the parallel courses acceptable?	A) NO	B) NO>YES	C) YES>NO	D)YES	
16)	Was the teacher on time at the lectures ?	A) NO	B) NO>YES	C) YES>NO	D)YES	
17)	Are lectures topics faithful to the syllabus presented at the beginning of the course?	A) NO	B) NO>YES	C) YES>NO	D)YES	
18)	Are lectures interesting?	A) NO	B) NO>YES	C) YES>NO	D)YES	
19)	Are lectures useful to understand the scientific and professional value of the given knowledge?	A) NO	B) NO>YES	C) YES>NO	D)YES	
20)	Are the lectures useful to prepare for the examination?	A) NO	B) NO>YES	C) YES>NO	D)YES	
21)	Does the teacher use the teaching supports such as slides, videos, overhead projector etc.) adequately?	A) NO	B) NO>YES	C) YES>NO	D)YES	
22)	Has the teacher explained evaluation and examination procedures and criteria?	A) NO	B) NO>YES	C) YES>NO	D)YES	
23)	Is the teaching material (books, handouts etc..) recommended or supplied by the teacher adequate?	A) NO	B) NO>YES	C) YES>NO	D)YES	
24)	Is the teacher able to explain clearly the topics, and make himself understood?	A) NO	B) NO>YES	C) YES>NO	D)YES	
25)	Is the amount of knowledge given during the course adequate?	A) NO	B) NO>YES	C) YES>NO	D)YES	
26)	Does the teacher motivate the students to learn the topics of the course?	A) NO	B) NO>YES	C) YES>NO	D)YES	
27)	Is the teacher available during consulting hours?	A) NO	B) NO>YES	C) YES>NO	D)YES	
28)	Does the teacher stimulate the interaction of the students during lectures?	A) NO	B) NO>YES	C) YES>NO	D)YES	
29)	Gives the teacher exhaustive answer to any explanation request?	A) NO	B) NO>YES	C) YES>NO	D)YES	

30)	Does the teacher comply with the official lectures calendar?	A) NO	B) NO>YES	C) YES>NO	D)YES	
31)	Does the teacher comply with the lecture's length?	A) NO	B) NO>YES	C) YES>NO	D)YES	
32)	It's useful to take lectures of this corse?	A) NO	B) NO>YES	C) YES>NO	D)YES	
33)	Are the teaching activities such as practical exercises, seminars, tutorials, etc. useful?	A) NO	B) NO>YES	C) YES>NO	D)YES	
34)	Is the level of difficulty of practical exercises or tutorials adequate?	A) NO	B) NO>YES	C) YES>NO	D)YES	
35)	Gives the teaching staff during practical exercises or tutorials exhaustive answer to any explanation request?	A) NO	B) NO>YES	C) YES>NO	D)YES	
36)	Does the teaching staff comply with the official calendar of practical exercises or tutorials?	A) NO	B) NO>YES	C) YES>NO	D)YES	
37)	Does the teaching staff comply with the length of practical exercises or tutorials?	A) NO	B) NO>YES	C) YES>NO	D)YES	
38)	Are the attendance to lectures and the study load adequate to pass the exam immediately after the end of the course?	A) NO	B) NO>YES	C) YES>NO	D)YES	
39)	Have your previous knowledge been sufficient to follow the lectures of the course?	A) NO	B) NO>YES	C) YES>NO	D)YES	
40)	Indipendently by ny opinion on this course I'm interested to this argument	A) NO	B) NO>YES	C) YES>NO	D)YES	
41)	Overall I'm satisfied with this course	A) NO	B) NO>YES	C) YES>NO	D)YES	

Comments:

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ANNEX 5.5

Data from the Dean office database on students examination (per Subject and per year)

	Students which passed examinations %			Months between the end of the course and the positive examination n.			Mean mark Pt. / 30		
	December 04	December 05	December 06	December 04	December 05	December 06	December 04	December 05	December 06
Applied biophysics and statistics	63.1	61.6	67.2	6.8	7.1	7.5	22.2	22.1	22.1
Propaedeutic biochemistry and molecular biology	74.5	89.3	90.9	5.2	5.4	5.6	23.8	23.9	23.9
Veterinary biochemistry	56.6	63.3	72.6	16.6	15.8	15.3	23.9	24.2	24.2
Veterinary anatomy	62.5	65.1	65.5	27.0	26.1	23.5	23.3	23.5	23.5
Zoology, ethnography and ethology	43.1	69.7	67.1	13.2	22.3	21.2	24.5	25.4	25.9
General economy and marketing	66.2	76.8	84.0	28.2	23.0	16.1	25.5	25.2	25.1
Mean 1st year	61.0	71.0	74.5	16.2	16.6	14.9	23.9	24.0	24.1
Veterinary physiology I	42.4	54.2	61.8	24.0	17.9	18.9	24.4	24.5	24.9
Veterinary physiology II and endocrinology	37.8	49.1	47.2	19.7	21.6	21.1	25.3	25.3	25.1
Veterinary functional anatomy	46.6	58.9	62.3	16.3	17.4	17.6	23.8	23.8	24.1
General Pathology and Veterinary Pathophysiology	28.5	41.4	45.7	24.1	27.8	28.9	25.2	24.8	24.3
Histological and general pathological anatomy	20.3	37.9	38.5	23.3	21.1	36.1	25.7	25.3	24.9
Pharmacology and general veterinary toxicology	27.6	33.0	32.0	27.0	28.6	26.0	25.5	25.3	24.4
Veterinary microbiology	45.6	53.5	56.4	11.4	12.1	12.9	23.2	23.3	23.4
Mean 2nd year	35.5	46.9	49.1	20.8	20.9	23.1	24.7	24.6	24.4
Animal breeding and economics of livestock production	43.1	58.7	60.3	13.2	15.3	5.9	24.5	24.8	25.3
Veterinary special pathological anatomy and necropsy	12.6	19.5	19.9	24.7	23.2	38.2	25.2	23.9	23.6
Veterinary diagnostic imaging and laboratory medicine	18.6	43.8	26.4	8.6	13.3	32.2	25.4	25.6	25.8
Pharmacology and special veterinary toxicology	24.5	19.9	17.3	16.1	17.8	20.5	25.2	25.0	24.6
Parasitology and Parasitic Diseases of Animals	33.9	40.5	37.2	8.5	9.5	14.2	24.6	24.6	24.7
Epidemiology and infectious diseases of animals	18.1	25.9	37.6	26.5	30.9	29.0	24.5	24.7	25.2
Veterinary medical and surgical semeiotic	20.5	23.8	22.9	21.1	23.7	26.7	25.2	25.2	25.7
Veterinary surgical pathology and surgical methods.	7.2	21.4	18.3	34.6	26.1	38.5	25.7	25.3	25.6
Mean 3rd year	22.3	31.7	30.0	19.2	20.0	25.7	25.0	24.9	25.0
Animal feeding and nutrition	28.8	54.3	43.2	18.4	8.1	11.9	24.3	24.7	25.0
Veterinary surgery	2.7	8.6	0.8	30.7	38.0	32.0	26.1	24.2	28.0
Avian anatomy and husbandry and poultry diseases	17.1	25.5	38.0	26.0	31.4	21.8	24.5	24.9	25.2
Obstetrics, pathophysiology of reproduction and artificial insemination	3.2	7.6	9.7	26.5	24.0	44.8	25.8	24.4	25.2
Inspection and control of food of animal origin: primary products	5.5	20.5	11.5	24.7	27.6	41.7	25.3	25.3	24.7
Infectious diseases, prophylaxis and animal health II	8.8	26.7	29.3	22.9	26.6	30.8	25.8	25.0	23.8
Veterinary internal medicine and veterinary forensic medicine.	8.3	23.8	13.6	21.8	25.0	36.9	25.4	25.6	25.9
Animal production	16.8	52.9	29.3	11.3	9.8	18.2	24.7	24.9	24.2
Veterinary anaesthesiology and surgical techniques	1.8	9.4	0.3	27.2	22.8	60.0	26.5	23.1	27.0
Mean 4th year	10.3	25.5	19.5	23.3	23.7	33.1	25.4	24.7	25.4
Internal Medicine and clinical therapeutic	2.8	13.2	6.6	21.8	25.7	30.6	24.9	26.4	25.4
Veterinary obstetrical clinics	2.2	10.4	13.7	18.5	19.6	37.0	26.2	23.0	25.4
Inspection and control of food of animal origin: processed products.	8.8	35.9	11.9	10.7		24.0	26.1	25.5	26.1
Corso Integrato Professionalizzante	2.2	1.9	4.2	19.4	24.0	18.9	27.7	30.0	27.6
Mean 5th year	4.0	15.3	9.1	17.6	23.1	27.6	26.2	26.2	26.1

ANNEX 6.1

Schematic plans of the Faculty

Plan 1 – Schematic general Plan Molinari

Plan 2 – Basement Floor Molinari

Plan 3 – Ground Floor Molinari

Plan 4 – First floor Molinari

Plan 5 – Second Floor Molinari

Plan 6 – Third basement Floor Cartecchio

Plan 7 – Second basement Floor Cartecchio

Plan 8 – First basement Floor Cartecchio

Plan 9 – Ground Floor Cartecchio

Plan 10 – First Floor Cartecchio

Plan 11 – Second Floor Cartecchio

Plan 12 – Third Floor Cartecchio

Plan 13 – Schematic general plan Chiareto

Plan 14 – Basement Floor Chiareto

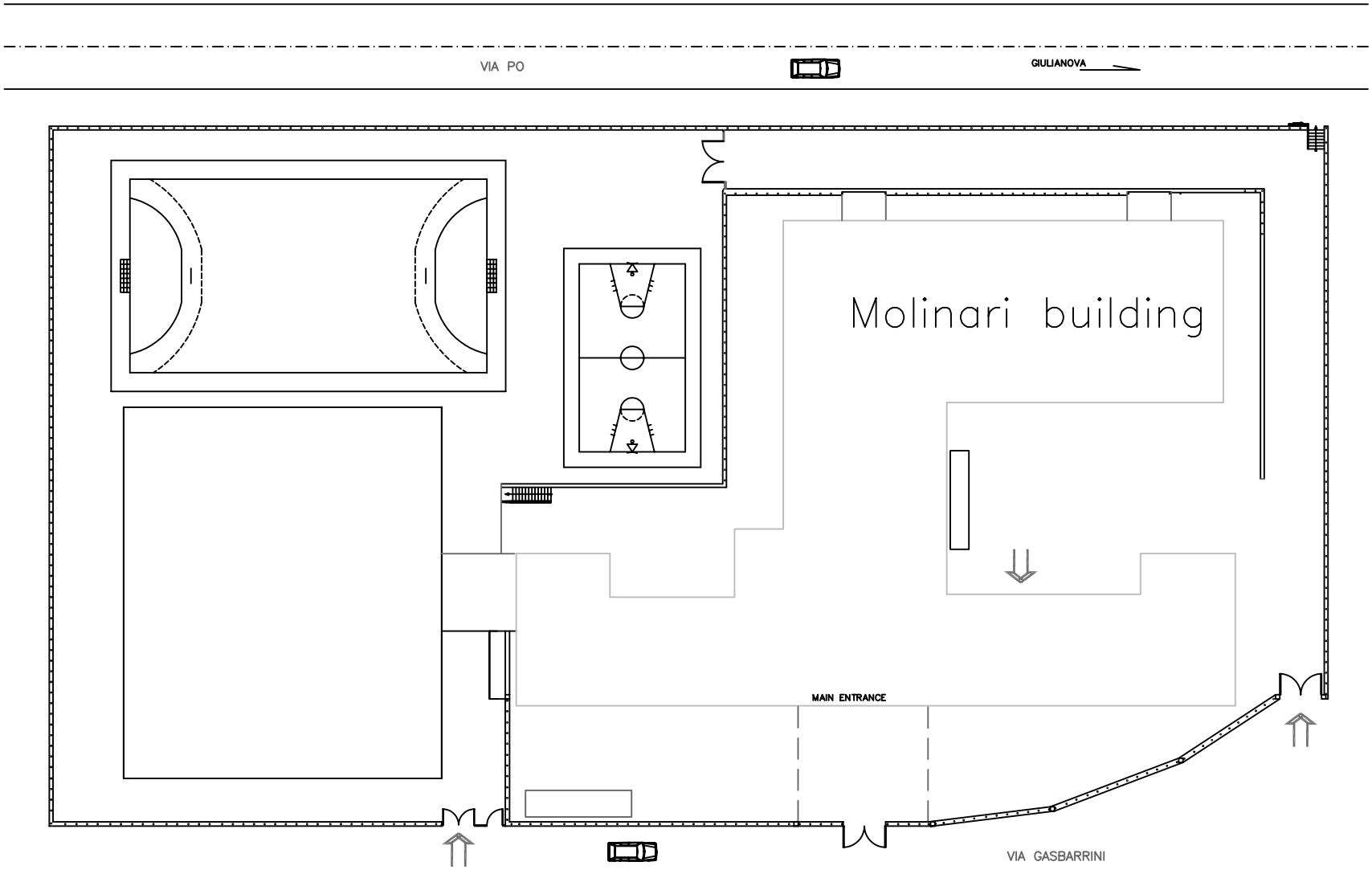
Plan 15 – Ground Floor Chiareto

University of Teramo – Veterinary Medicine

MOLINARI – Piazza Aldo Moro – Teramo

Annex 6.1 – Plan 1

GENERAL PLAN



University of Teramo – Veterinary Medicine

MOLINARI – Piazza Aldo Moro – Teramo

Annex 6.1 – Plan 2

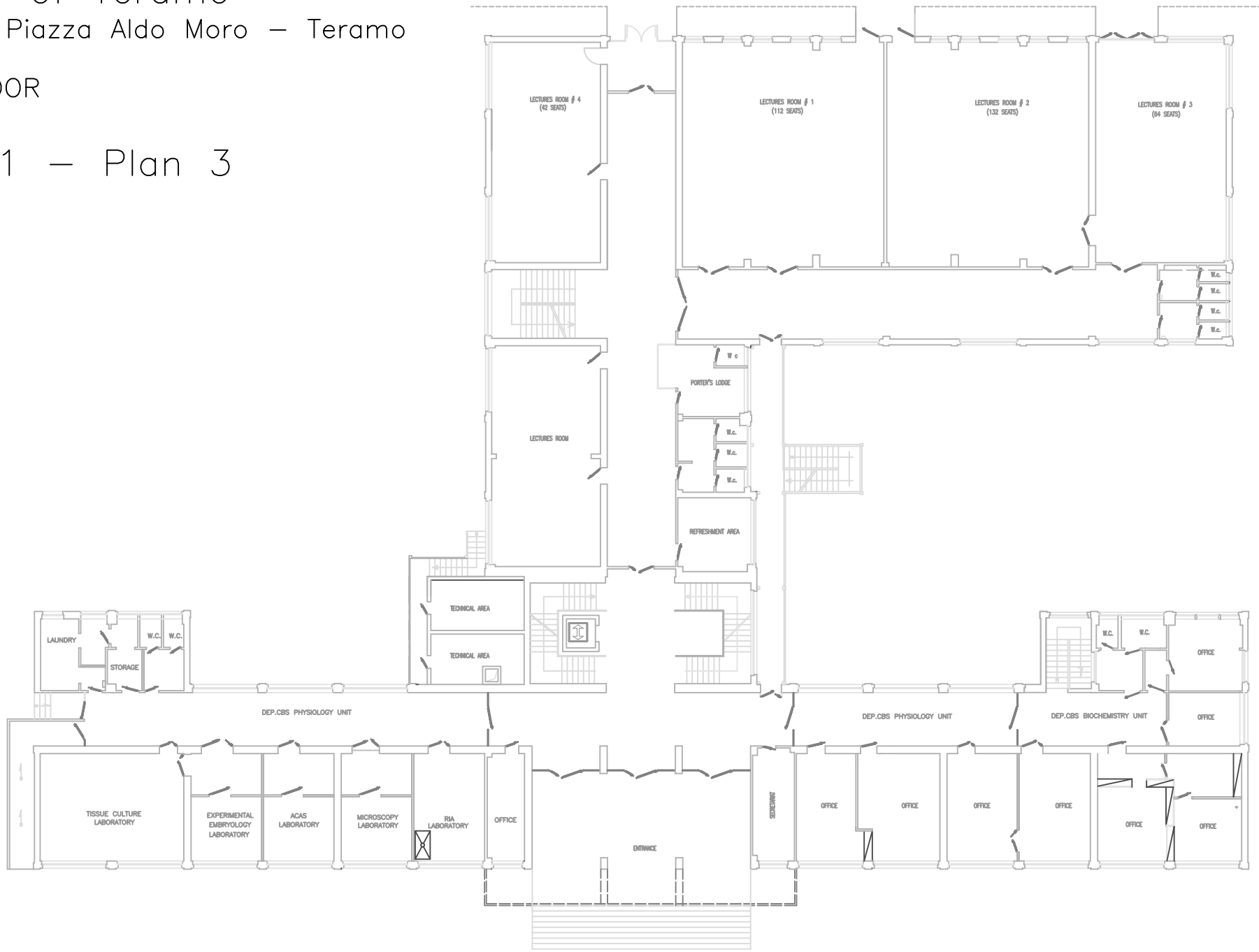
BASEMENT FLOOR

University of Teramo

MOLINARI – Piazza Aldo Moro – Teramo

GROUND FLOOR

Annex 6.1 – Plan 3

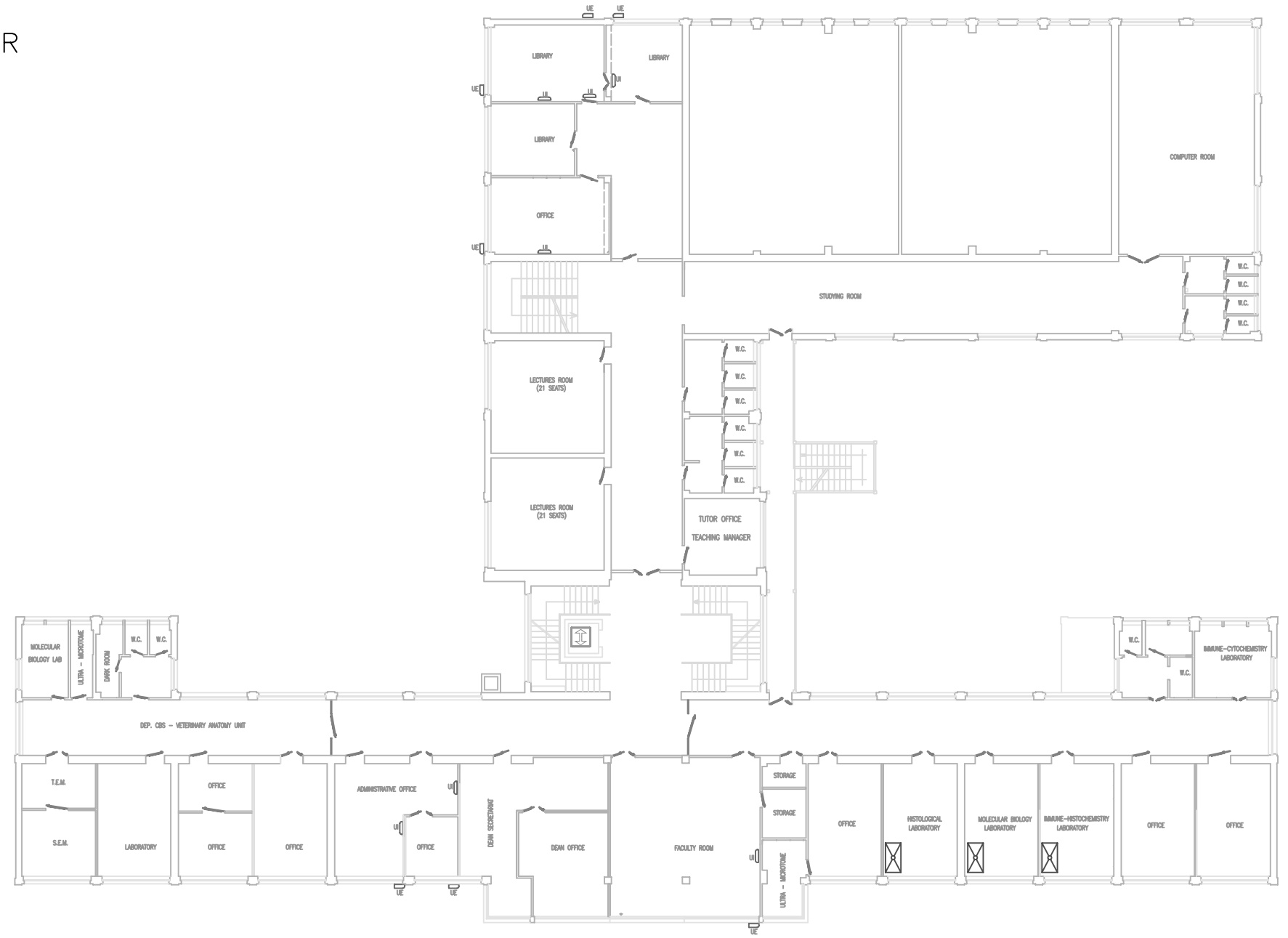


University of Teramo

MOLINARI – Piazza Aldo Moro – Teramo

Annex 6.1 – Plan 4

FIRST FLOOR

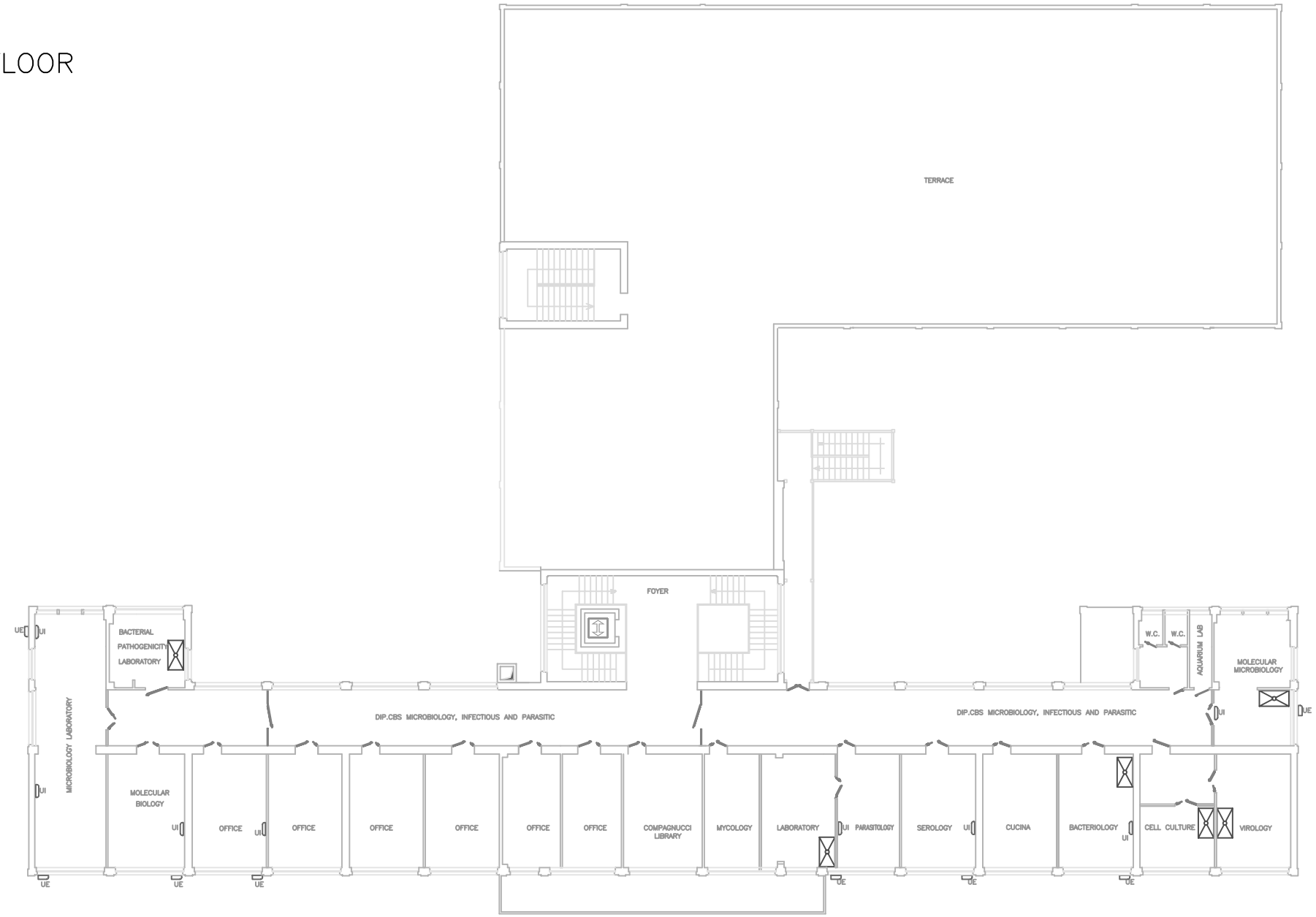


University of Teramo – Veterinary Medicine

MOLINARI – Piazza Aldo Moro – Teramo

Annex 6.1 – Plan 5

SECOND FLOOR

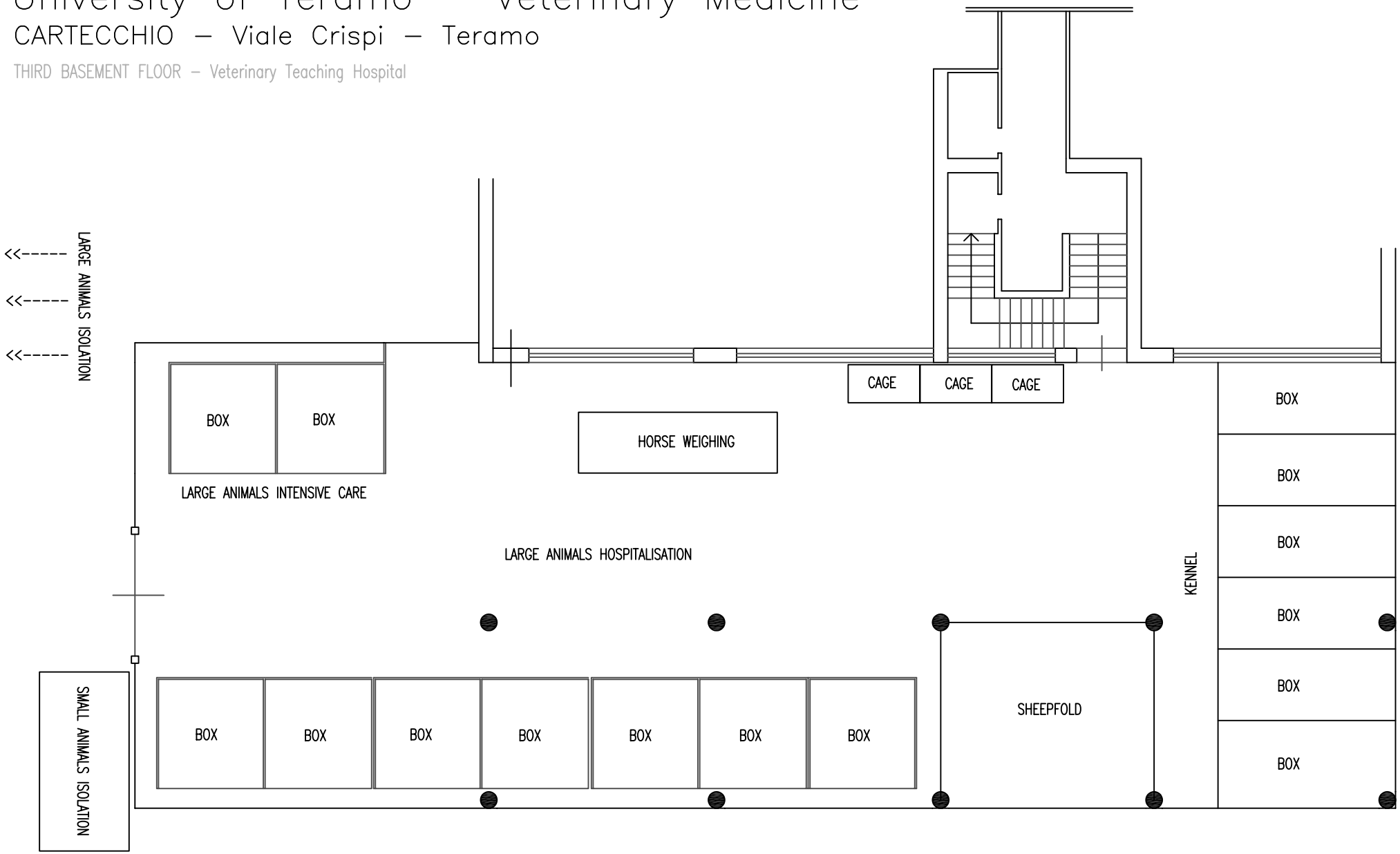


University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

THIRD BASEMENT FLOOR – Veterinary Teaching Hospital

Annex 6.1 – Plan 6



University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

Annex 6.1 – Plan 7

SECOND BASEMENT FLOOR

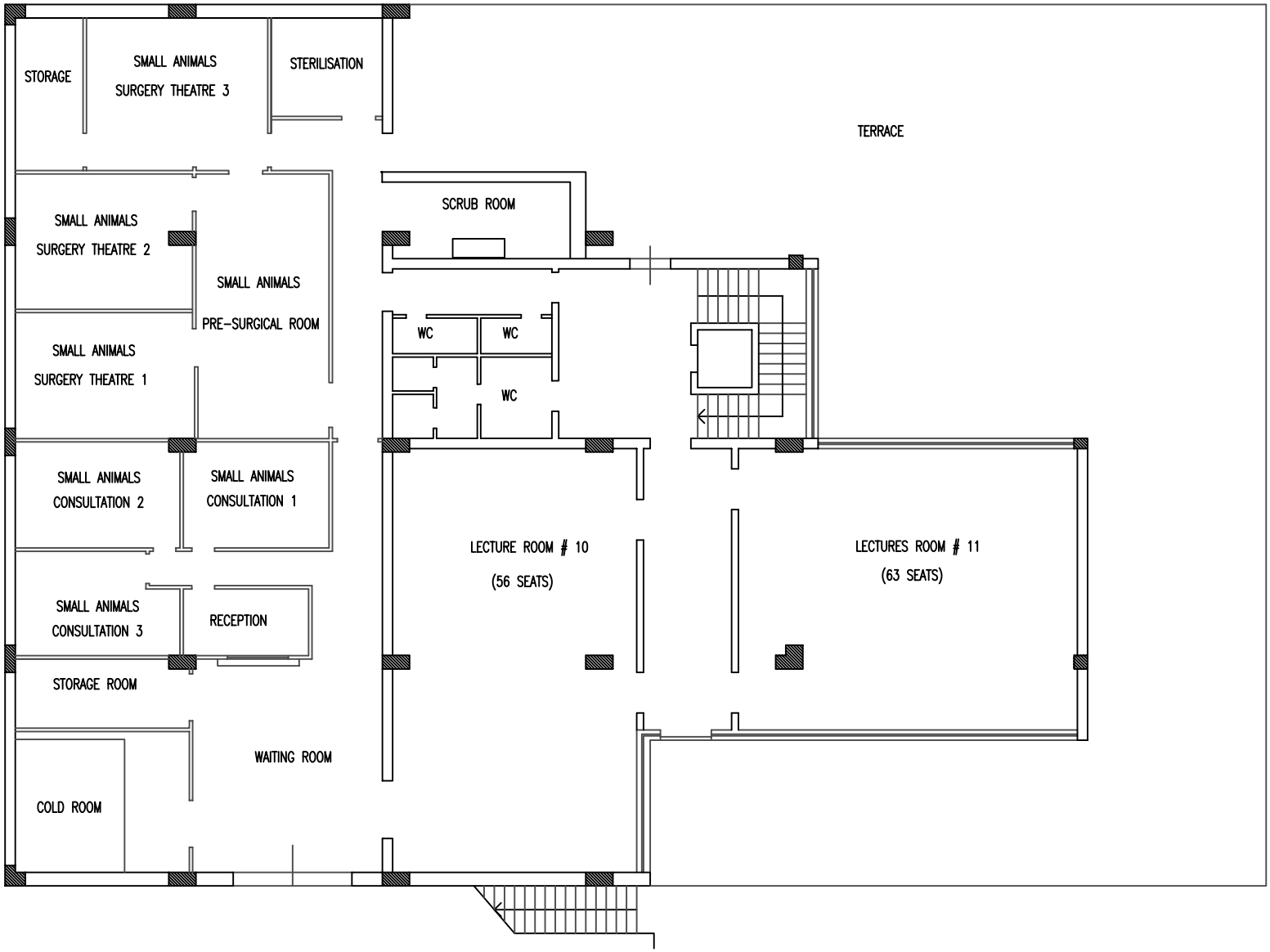
Veterinary Teaching Hospital

University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

Annex 6.1 – Plan 8

FIRST BASEMENT FLOOR – Veterinary Teaching Hospital – Lectures Rooms

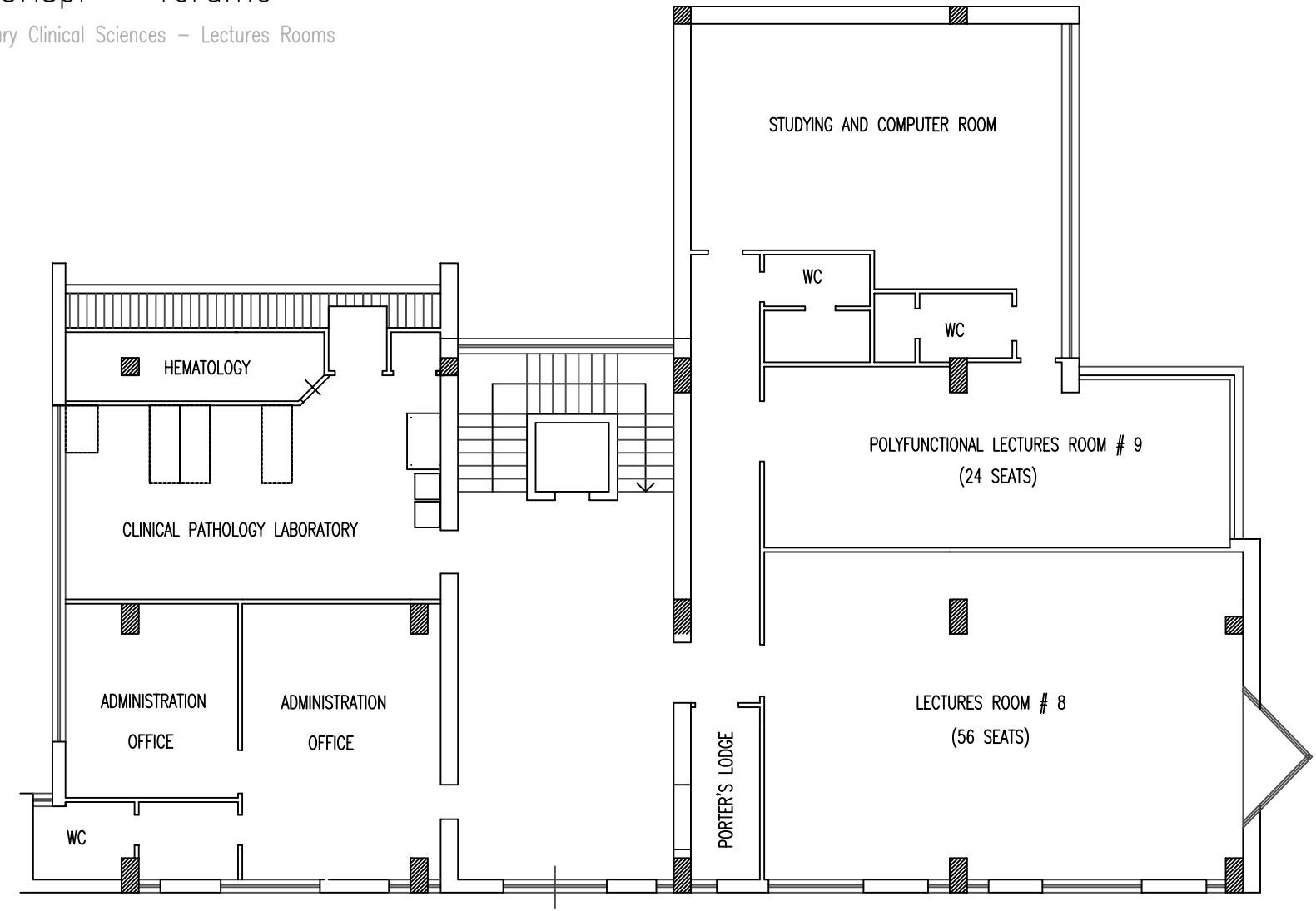


University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

GROUND FLOOR – Department of Veterinary Clinical Sciences – Lectures Rooms

Annex 6.1 – Plan 9



University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

FIRST FLOOR – Department of Veterinary Clinical Sciences

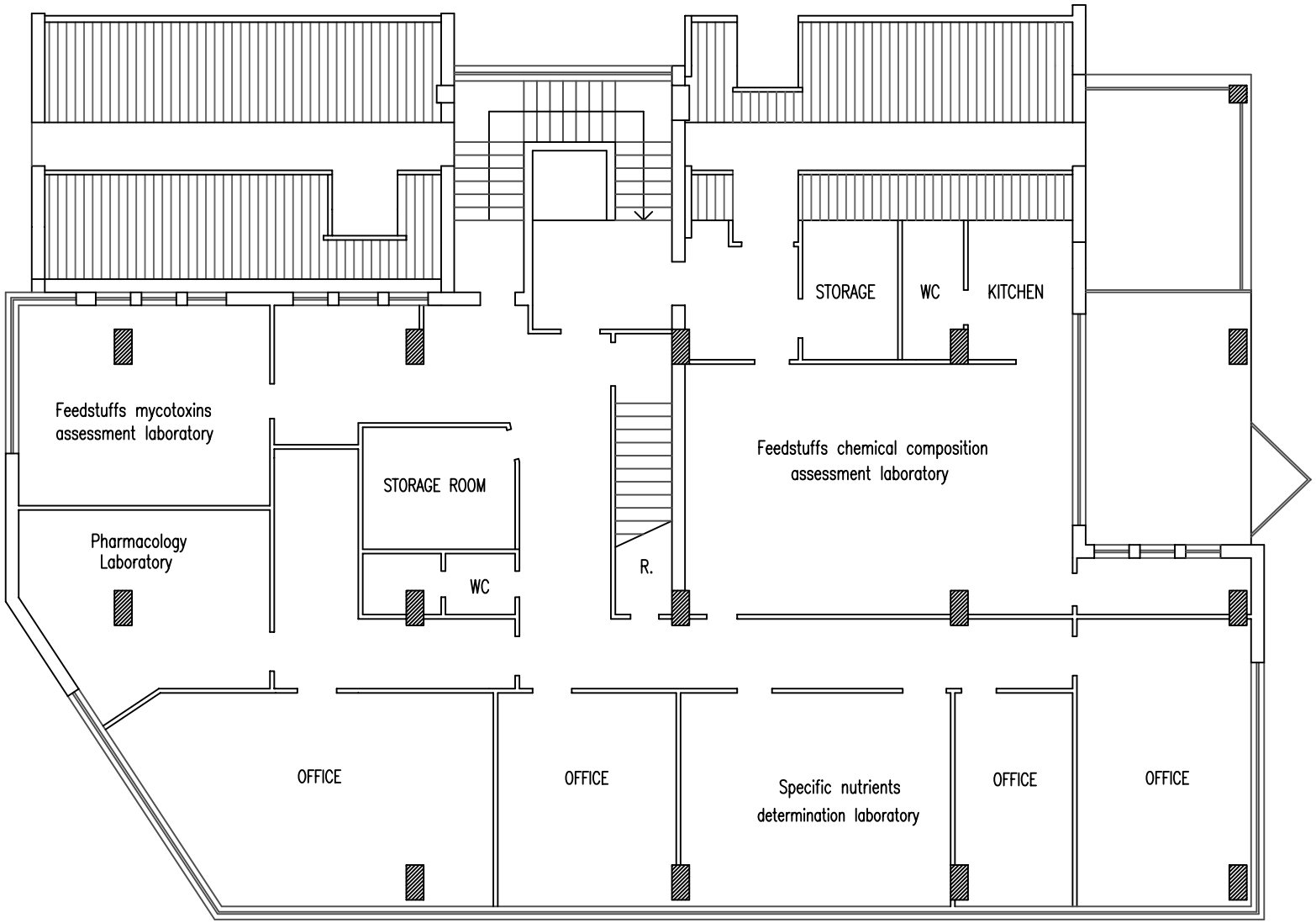
Annex 6.1 – Plan 10

University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

SECOND FLOOR – Department of Food Sciences

Annex 6.1 – Plan 11

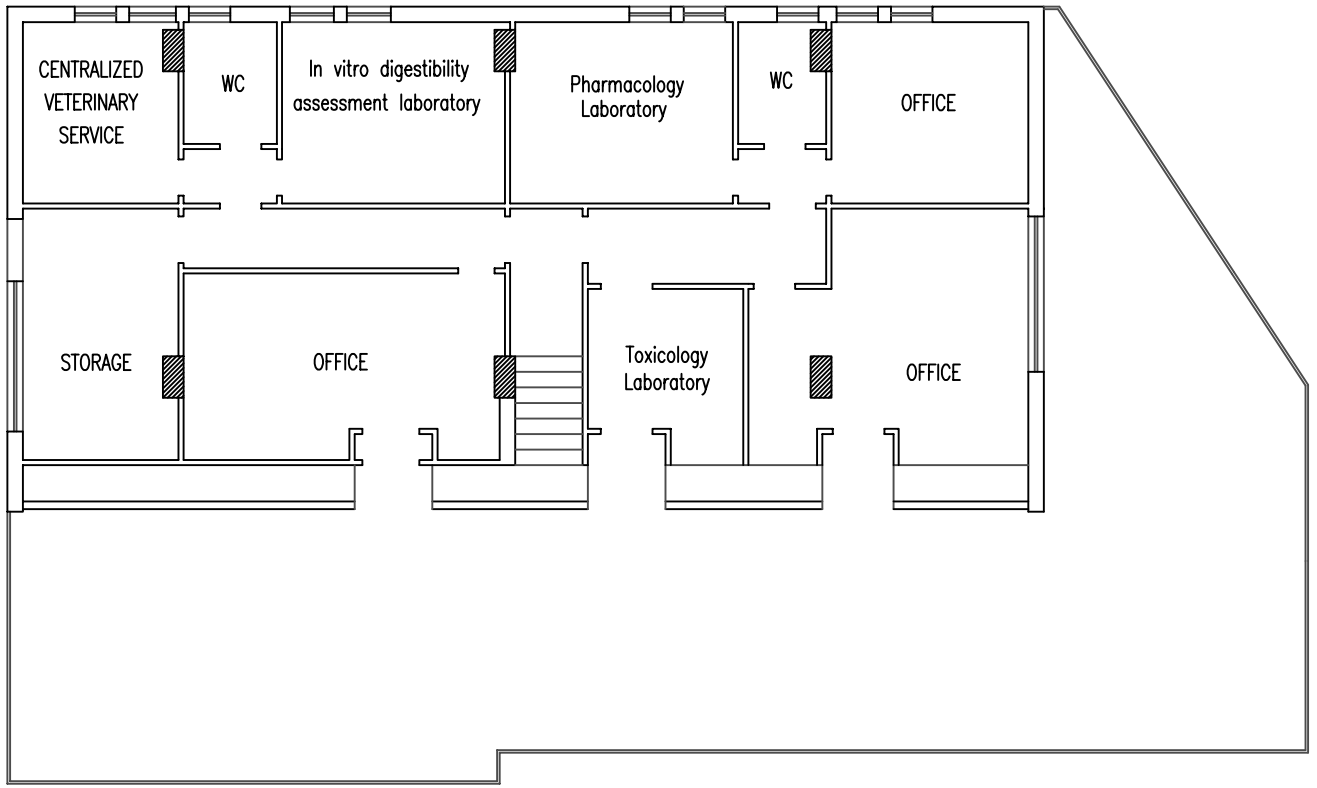


University of Teramo – Veterinary Medicine

CARTECCHIO – Viale Crispi – Teramo

THIRD FLOOR – Depatment of Food Sciences

Annex 6.1 – Plan 12

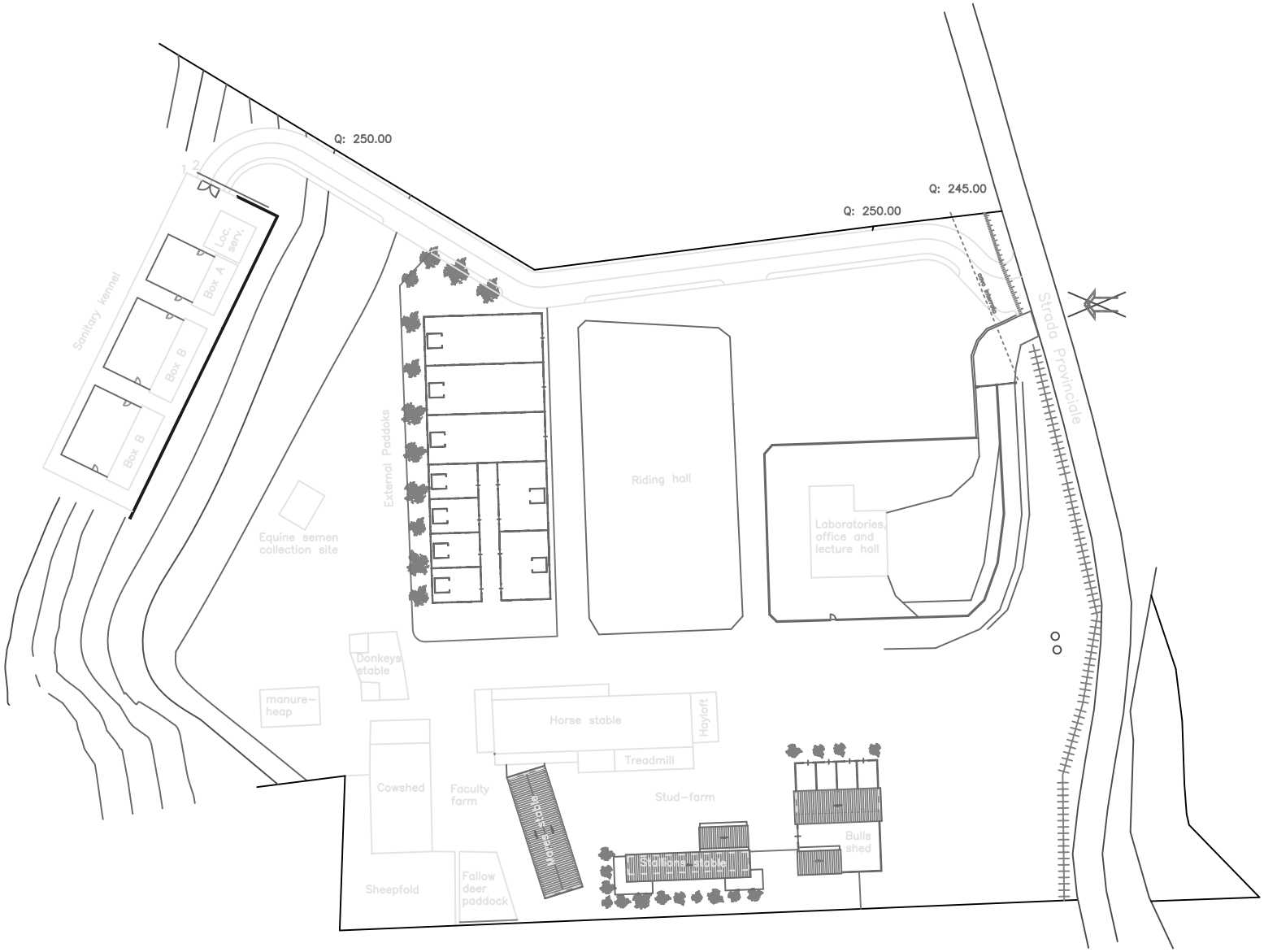


Università degli Studi di Teramo

CHIARETO (Bellante)

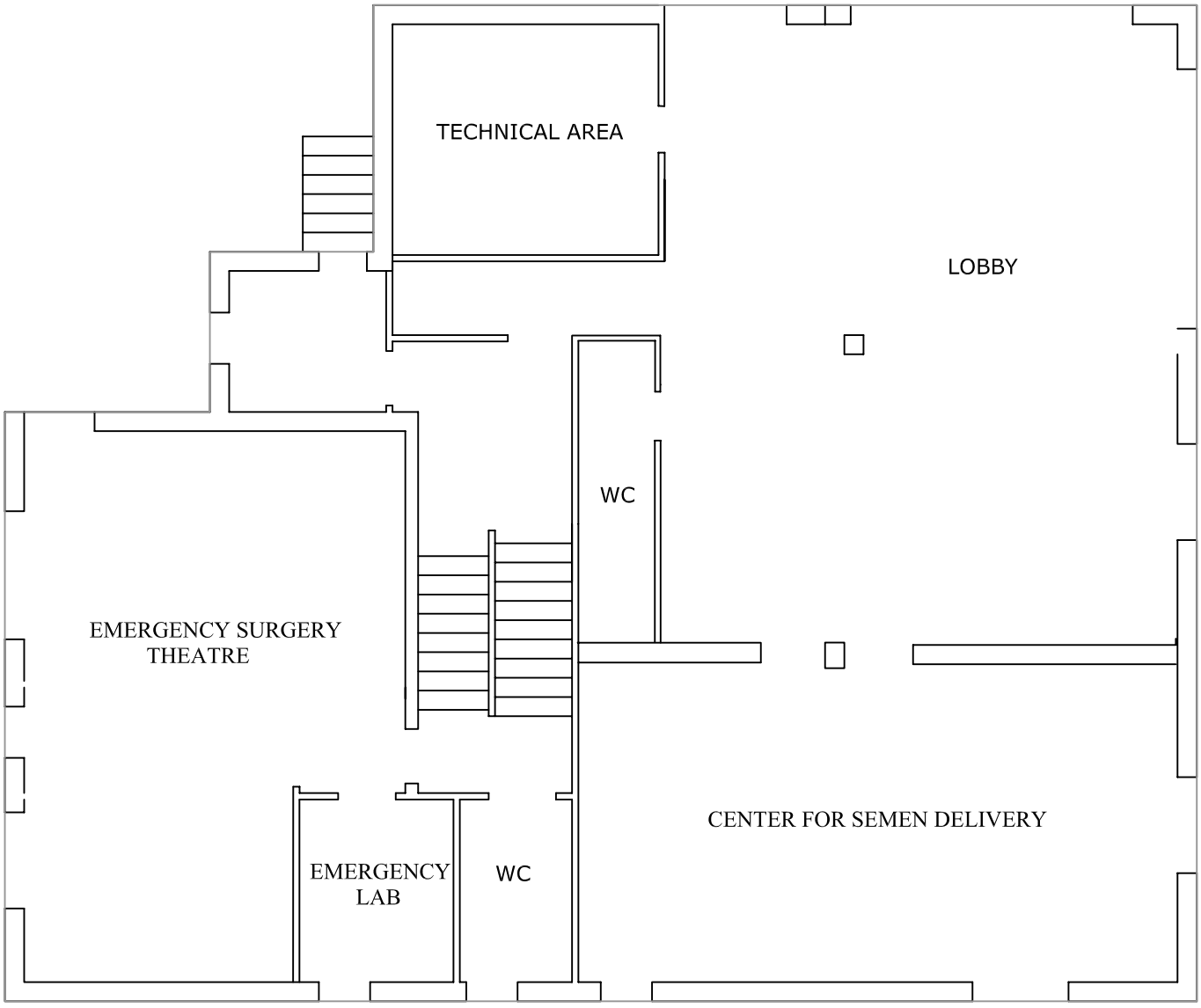
SCHEMATIC GENERAL PLAN

Annex 6.1 – Plan 13



University of Teramo
Chiareto (Bellante)

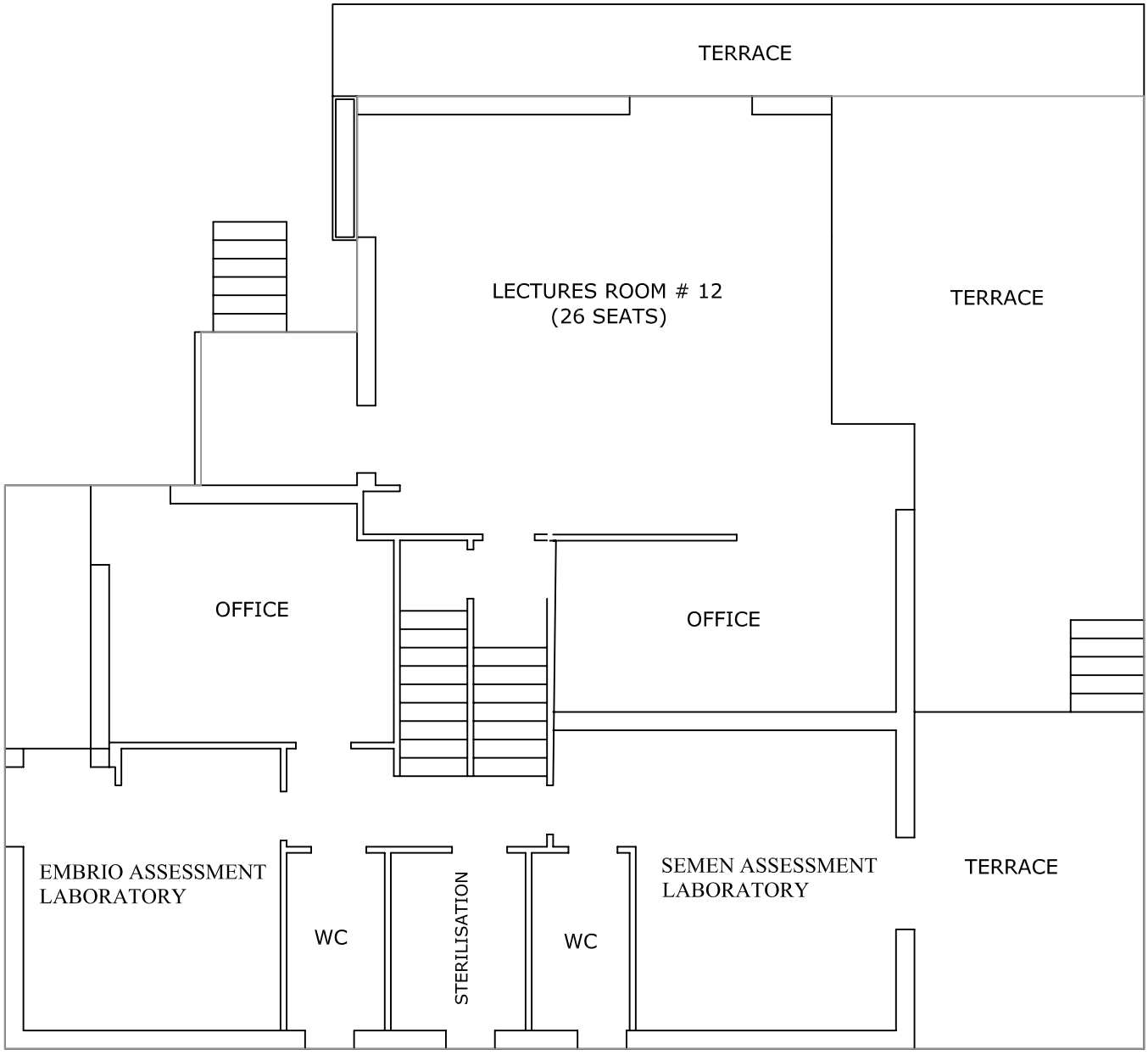
Annex 6.1 - Plan 14



BASEMENT FLOOR

University of Teramo
Chiareto (Bellante)

Annex 6.1 - Plan 15



FIRST FLOOR

ANNEX 6.2

Schematic Prospects of the new premises including The Veterinary Teaching Hospital (under construction)