### Department of Biomedical Sciences

**Subject information (Overview of Syllabus)**
The syllabus content is subject to change to accommodate industry changes. Please note: A more detailed syllabus is available at the department or in the study guide that is applicable to a particular subject. On 29 April 2016, the syllabus content was defined as follows:

#### A

<table>
<thead>
<tr>
<th>Subject Code</th>
<th>Subject Name</th>
<th>Duration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ANATOMY I (ANA100B)</td>
<td>1 X 3-HOUR PAPER</td>
<td>(Subject custodian: Department of Biomedical Sciences)</td>
</tr>
<tr>
<td>ANATOMY I (ANA100T)</td>
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<tr>
<td>ANATOMY AND PHYSIOLOGY I (APY141T)</td>
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<tr>
<td>ANATOMY AND PHYSIOLOGY II (APY211T)</td>
<td>1 X 3-HOUR PAPER</td>
<td>(Subject custodian: Department of Biomedical Sciences)</td>
</tr>
<tr>
<td>APPLIED VETERINARY TECHNOLOGY II (AVT201T)</td>
<td>CONTINUOUS ASSESSMENT</td>
<td></td>
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<tr>
<td>BIOCHEMISTRY II (BCH221T)</td>
<td>1 X 3-HOUR PAPER</td>
<td>(Subject custodian: Department of Biomedical Sciences)</td>
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<tr>
<td>BIOCHEMISTRY III (BCH311T)</td>
<td>1 X 3-HOUR PAPER</td>
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<tr>
<td>BIOCHEMISTRY TECHNIQUES (BCQ101T)</td>
<td>1 X 3-HOUR PAPER</td>
<td>(Subject custodian: Department of Biomedical Sciences)</td>
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<tr>
<td>BIOMEDICAL APPARATUS AND PROCEDURES II (BPR200T)</td>
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- **ANATOMY I (ANA100B):** Systemic anatomy, including osteology, anthropology, myology, neurology, angiology, splanchnology, surface anatomy and regional anatomy. Special emphasis is placed on the organ systems (Cardiovascular, Lymphatic, Urinary, and respiratory systems). (Total tuition time: ± 120 hours)
- **ANATOMY I (ANA100T):** An integrated study of the human body systems. (Total tuition time: ± 153 hours)
- **ANATOMY AND PHYSIOLOGY I (APY141T):** The subject serves as an introduction to subjects following later in the qualification. The emphasis is on cell structure and tissues. All the systems in the body are discussed, with the emphasis on those aspects of importance to the qualification. (Total tuition time: ± 90 hours)
- **ANATOMY AND PHYSIOLOGY II (APY211T):** An integrated study of micro-anatomy, physiological anatomy, physiology and physiological chemistry of the following systems: endocrine, nervous, reproductive. (Total tuition time: ± 60 hours)
- **APPLIED VETERINARY TECHNOLOGY II (AVT201T):** A training programme is drawn up in collaboration with the supervisor at an accredited laboratory. (Total tuition time: six months)

#### B

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- **BIOCHEMISTRY II (BCH221T):** Nucleic acids, pH and buffers carbohydrates, amino acids and proteins, enzymes and lipids, DNA replication, transcription and protein synthesis. (Total tuition time: ± 90 hours)
- **BIOCHEMISTRY III (BCH311T):** Metabolism of carbohydrates, lipids, proteins and nitrogen-containing compounds. (Total tuition time: ± 90 hours)
- **BIOCHEMISTRY TECHNIQUES (BCQ101T):** Introduction to clinical chemistry. Specimen collection. Sample analysis (enzymes and minerals). Laboratory instruments, automation and maintenance. A brief description of cellular macromolecules (proteins, lipids, carbohydrates, nucleic acids). (Total tuition time: ± 90 hours)
- **BIOMEDICAL APPARATUS AND PROCEDURES II (BPR200T):** General first aid. Patient monitoring. Clinical application of infusion. Medical terminology. (Total tuition time: not available)
BLOOD TRANSFUSION TECHNOLOGY (BDT211T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Basic immunology and genetics, ABO, Rh, HLA and other systems, determination of ABO and Rh blood
groups, government regulations, preparation of blood components and applicable laboratory tests. (Total
tuition time: ± 90 hours)

CALCULATIONS AND STATISTICS (CAL101T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Mathematics and Statistics)
Trigonometry. Statistical calculations: basic descriptive statistics, elementary probabilities, the normal prob-
ability division. (Total tuition time: ± 45 hours)

CARDIOLOGY IV (CRD400T/R) PROJECT ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)
Interventional management of arrhythmias. Cardiac pharmacology. (Total tuition time: not available)

CARDIOLOGY: BIOMEDICAL APPARATUS III (CBM300T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Haemodynamic monitoring techniques and specialised equipment. Blood-gas analysis equipment, arrhythmia
monitoring apparatus. Intra-aortic balloon pump. Vector cardiology, echocardiography, exercise stress test,
electrocardiography. Phonocardiography, nuclear cardiology. Pericardiocentesis. (Total tuition time: not available)

CARDIOLOGY: CLINICAL PRACTICE III (KKP300T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
The electrocardiogram. Vector cardiology. Cardiovascular resuscitation. Intra-aorta balloon pump. The tempo-
rary pacemaker. Electro-physiological studies. Pericardiocentesis, cardioversion, cardiac catherisation. Exercise
stress test, electrocardiography, echocardiography, arrhythmia monitoring techniques. Phonocardiography. Nuclear
cardiology. (Total tuition time: not available)

CARDIOLOGY: CLINICAL TECHNOLOGY PRACTICE III (EXP3KKP) WORK-INTEGRATED LEARNING
(Subject custodian: Department of Biomedical Sciences)
Practice-based competency tests of all the relevant cardiological procedures and skills. (Total tuition time: not available)

CELLULAR PATHOLOGY I (CPG101T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Introduction to cellular pathology. Preparation techniques for histology: collection and fixation of tissues, em-
bedding and sectioning of tissues, staining and mounting. (Total tuition time: ± 90 hours)

CELLULAR PATHOLOGY II (CPG221T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Biological behaviour of cells and tissues. Concepts of tissue growth. Functional differentiation. Normal mor-
phology of tissues. Preparatory techniques for cytology. Histology and cytology of the female genital tract.
(Total tuition time: ± 90 hours)

CELLULAR PATHOLOGY III (CPG301T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Histology and cytology of the respiratory tract, urinary tract, gastro-intestinal tract and serous cavities. Cytology
of other sites: fine-needle aspiration and the central nervous system. Cytopathology, techniques and application.
(Total tuition time: ± 90 hours)

CHEMICAL PATHOLOGY I (CPH111T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
General laboratory information, Laboratory safety and regulations, Quality control, Water, electrolytes and
minerals, Blood gases, pH and buffer systems, Renal function. (Total tuition time: ± 90 hours)
CHEMICAL PATHOLOGY II (CPH241T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Laboratory instruments, automation and maintenance. Amino acids and proteins. Immuno-chemical techniques. Carbohydrate metabolism. Lipid metabolism. CSF and other body fluids and prenatal testing. (Total tuition time: ± 90 hours)

CHEMICAL PATHOLOGY III (CPH311T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Enzymes, hepatic function, trace elements, tumour markers, endocrinology, pharmacology, molecular diagnostics. (Total tuition time: ± 90 hours)

CHEMISTRY IB (CHE141C) 1 X 3-HOUR PAPER
(Subject custodian: Department of Chemistry)
Inorganic chemistry: atoms, molecules, periodic table, mole concept, chemical calculations, chemistry and elements of groups 1A, 4A, 5A, 6A. Organic chemistry: introduction, alkanes, alkenes, aromates, alkanols, phenols, halogen compounds, alkanoates, alkynes, aldehydes, ketones and alkanic acids. (Total tuition time: ± 90 hours)

CHEMISTRY IB: EXTENDED (FPCLS01) 1 X 3-HOUR PAPER
(Subject custodian: Department of Chemistry)

CLINICAL RADIOGRAPHIC PRACTICE I (CRP100T) PRACTICAL EXAMINATION
(Subject custodian: Department of Biomedical Sciences)
Application of Radiographic Practice I in the imaging department. Work-integrated learning and continuous clinical assessment are conducted in Health Professions Council of South Africa (HPCSA), approved clinical settings. (Total tuition time: ± 204 hours, continuous)

CLINICAL RADIOGRAPHIC PRACTICE II(D) (CRP200T) PRACTICAL EXAMINATION
(Subject custodian: Department of Biomedical Sciences)
Application of Radiographic Practice II in the imaging department. Work-integrated learning and continuous clinical assessment are conducted in Health Professions Council of South Africa (HPCSA), approved clinical settings. (Total tuition time: ± 117 hours, continuous)

CLINICAL RADIOGRAPHIC PRACTICE III(D) (CRP300T) PRACTICAL EXAMINATION
(Subject custodian: Department of Biomedical Sciences)
Application of Radiographic Practice III in the imaging department. Work-integrated learning and continuous clinical assessment are conducted in Health Professions Council of South Africa (HPCSA), approved clinical settings. (Total tuition time: ± 224 hours, continuous)

COMPUTER APPLICATIONS I (COA101C) CONTINUOUS ASSESSMENT
(Subject custodian: End User Computing Unit)
Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total tuition time: ± 40 hours)

COMPUTER SKILLS I (CSK101B)
COMPUTER SKILLS I (CSKH501)
(Subject/Module custodian: End User Computing Unit)
Students have to acquire theoretical knowledge (computing fundamentals) and practical skills as an end-user in operating systems and MS Office Suite applications (MS Word, MS Excel and MS PowerPoint) on an introductory level. Students will do online and computer based tests. The modules are mapped with SAQA and IC3 Essential Skills for Digital Literacy (international certification). (Total tuition time: ± 40 hours)
CRITICAL CARE IV (CTC400T/R) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Biomedical Sciences)  
Pathophysiology. Treatment regimes. Nutrition. (Total tuition time: not available)

CRITICAL CARE: BIOMEDICAL APPARATUS III (CBP310T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Biomedical Sciences)  
Electrocardiography, invasive and non-invasive pressure monitoring, assessment of pulmonary volumes, measurements (pH, blood gas and electrolytes), treatment of respiratory failure, clinical anaesthesia, thermometry, assessment of homeostasis, infusion devices. (Total tuition time: not available)

CRITICAL CARE: CLINICAL PRACTICE III (KSK310T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Biomedical Sciences)  
Electrical safety, electrocardiography, cardio-pulmonary resuscitation, invasive and non-invasive pressure monitoring, assessment of pulmonary volumes, blood-gas sampling, arterial oxygen saturation, acid-base values, nebulisation, humidification, positive pO₂. (Total tuition time: not available)

CRITICAL CARE: CLINICAL TECHNOLOGY WORK-INTEGRATED LEARNING PRACTICE III (EXP3KSK)  
(Subject custodian: Department of Biomedical Sciences)  
Practice-based competency tests of all the relevant critical-care procedures and skills. (Total tuition time: not available)

ENTREPRENEURIAL SKILLS (EPS101T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Management and Entrepreneurship)  
Entrepreneurship, core business strategies, marketing strategies, operational strategies, financial planning and management, human resource planning. (Total tuition time: ± 60 hours)

EXPERIMENTAL ANIMAL TECHNOLOGY II (EAT211T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Biomedical Sciences)  
Handling, care, husbandry, nutrition, breeding of experimental animals, e.g. mice, rats, guinea-pigs and rabbits, and the prevention of diseases. Design of captivity facilities. Feeding, ventilation and sterilisation systems. Genetics and legislation concerning experimental animals. (Total tuition time: ± 90 hours)

FOOD ANIMALS ANATOMY AND PHYSIOLOGY I (VDA111T) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Biomedical Sciences)  
Microscopic and macroscopic study of all structures and organs in the bodies of food animals, as well as the functioning of these organs and structures. (Total tuition time: ± 90 hours)

FOUNDATION ENGLISH (FPENG02, FPENG05) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Applied Languages)  
Interpret, relate and reflect on all available and relevant resource material in proper English. Communicate orally in a comprehensible and clear manner in both general and subject-specific communication. Demonstrate intermediate-Level of proficiency in written English. (Total tuition time: ± 160 hours)

FOUNDATION LIFE SKILLS (FPLSK02) 1 X 3-HOUR PAPER  
(Subject custodian: Department of Management and Entrepreneurship)  
Campus ethics, learning styles and whole-brain thinking, self-image and assertive behaviour, time management, self-motivation, conflict management, sexuality and relationships, problem-solving skills, managing stress, the multicultural society, techniques for summarising and memorising, how to cope with assessments and assignments, creativity, and many more. The life-skills sessions are participative, with group discussions and personal application to optimise student’s learning experience. (Total tuition time: ± 128 hours)
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<tr>
<th>Course Title</th>
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<tr>
<td><strong>HAEMATOLOGY II (HAT221T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Origin and normal development of the haemopoietic elements, erythrocytes and leukocytes, platelet/megakaryocyte system and haemostasis. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>HAEMATOLOGY III (HAT321T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Abnormal erythrocyte morphology and function, leucocytes and thrombocytes. Causes and laboratory findings of anaemia, leukaemias and coagulation defects. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>HAEMATOLOGY: VETERINARY SCIENCE (HVS201T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Morphology and functions of erythrocytes, leucocytes and thrombocytes, applicable laboratory tests. Abnormal morphology and functions of blood cells, causes and laboratory findings of anaemias and coagulation defects. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>HELMINTHOLOGY III (HEM301T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Identification of parasitic helminths on the grounds of diagnostic characteristics. The life cycle of helminths and prevention and control measures are studied in detail. Recognition and pathology of diseases. Laboratory techniques are introduced. (Total tuition time: ± 90 hours)</td>
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<tr>
<td><strong>HISTOLOGY (HTL201T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Fixation, embedding and cutting of tissue. Staining and mounting of histological slide preparations. Preparations are used for diagnosis. Cell structures and basic tissue types. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>IMMUNOLOGY II (IML211T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) Specific and non-specific immunity. Antigens. Classification and characteristics of antibodies. Lymphoid organs of antibody production. Antigen-antibody reactions, including complement, precipitation, phagocytosis and agglutination. Cellular and humoral immunity. Serological techniques. Immunopathology. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>INTEGRATED PATHOPHYSIOLOGY IV (IPP400T)</strong></td>
<td>1</td>
<td>(Subject custodian: Department of Biomedical Sciences) The pathogenesis of the different systems of the body are studied with reference to the following systems: the skin, skeleton, muscle, nervous, endocrine, cardiovascular, lymphatic, respiratory, digestive, urinary and reproductive systems. The emphasis is on laboratory diagnosis and not on clinical cases. Case studies will be used. (Total tuition time: ± 90 hours)</td>
</tr>
<tr>
<td><strong>INTRODUCTION TO MEDICAL TECHNOLOGY (IMT101T)</strong></td>
<td>CONTINUOUS ASSESSMENT</td>
<td>(Subject custodian: Department of Biomedical sciences) The field of medical technology. Introduction to medical laboratory practices, terminology and safety. (Total tuition time: ± 60 hours)</td>
</tr>
<tr>
<td><strong>INTRODUCTION TO VETERINARY TECHNOLOGY (IVT101T)</strong></td>
<td>CONTINUOUS ASSESSMENT</td>
<td>(Subject custodian: Department of Biomedical Sciences) Introduction to laboratory practices, terminology, accreditation and safety in the laboratory. (Total tuition time: ± 60 hours)</td>
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LAB MANAGEMENT AND QUALITY (LMQ101T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)

LABORATORY MANAGEMENT (LMG201T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Management and Entrepreneurship)
Personnel and financial management. Management information systems. Communication. Entrepreneurial skills. (Total tuition time: ± 60 hours)

LABORATORY PRACTICE III (EXP3LAP) WORK-INTEGRATED LEARNING
(Subject custodian: Department of Biomedical Sciences)
Performing, interpretation and integration of laboratory tests in the following disciplines of Blood Transfusion Technology (Immunohaematology), Chemical Pathology, Cytology, Haematology, Histology, Medical Microbiology and Virology. (Total tuition time: not available)

MANAGEMENT PRINCIPLES AND PRACTICE I (MPP100B) 1 X 3-HOUR PAPER
(Subject custodian: Department of Management and Entrepreneurship)
Basic management skills and techniques, as well as office management. Advanced personnel and financial management. Dealing with conflict and diversity. (Total tuition time: ± 60 hours)

MATHEMATICS I: EXTENDED (FPMAT06) 1 X 3-HOUR PAPER
MATHEMATICS IB: EXTENDED (FPMLS01) 1 X 3-HOUR PAPER
(Subject custodian: Department of Mathematics and Statistics)

MICROBIOLOGY I (MBI101T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biotechnology and Food Technology)

MICROBIOLOGY I: EXTENDED (FPMLB01) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biotechnology and Food Technology)
General microbiology, chemical and physical control, environmental microbiology, food microbiology, occupational microbiology and microbiology ecology. Practical microbiological techniques. (Total tuition time: ± 248 hours)

MICROBIOLOGY II (MBI241B) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Enrichment culture techniques and long-term preservation of micro-organisms. Advanced composition and structure of prokaryotes. Introduction to the genetics of micro-organisms. Microbial metabolism. Identification of the more important groups of bacteria, using biochemical and serological tests. (Total tuition time: ± 90 hours)

MICROBIOLOGY III (MBI321T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Medical mycology: classification of yeasts and moulds of medical importance, mycological procedures, pathogenesis and laboratory identification of medically important yeasts and moulds. Medical parasitology: classification of protozoa and helminths of medical importance, parasitological procedures, life cycles and pathogenicity of medically important parasites. Medical virology: general properties and classification of medically important viruses, culturing of viruses, the properties, isolation and culturing of medically important viruses. (Total tuition time: ± 90 hours)
MOLECULAR BIOLOGY III (MLB301T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Amino acids and proteins. DNA/RNA. Molecular biology principles and techniques as it applies to the veterinary laboratory for use in diagnosis of disease. Techniques include isolation of nucleic acids from biological fluids, electrophoresis, PCR, viral load testing and DNA sequencing. (Total tuition time: ± 90 hours)

MOLECULAR BIOLOGY IV (MLB400T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)

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NEPHROLOGY IV (NEP400T/R) PROJECT ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)
Anatomy of the renal system. Functions of the kidney, excretory function of the kidney. Renal processing of individual substances, water balance, micturition, renal function tests and abnormalities. (Total tuition time: not available)

NEPHROLOGY: BIOMEDICAL APPARATUS III (NRB310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
History, development and theory of dialysis. Optimalisation of therapy (blood/dialysate). Water treatment. (Total tuition time: not available)

NEPHROLOGY: CLINICAL PRACTICE III (NRC310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Patient observation, blood transfusions, setting up disposable equipment, haemodialysis. (Total tuition time: not available)

NEPHROLOGY: CLINICAL TECHNOLOGY PRACTICE III WORK-INTEGRATED LEARNING
(EXP3NRC)
(Subject custodian: Department of Biomedical Sciences)
Practice-based competency tests of all the relevant nephrological procedures and skills. (Total tuition time: not available)

NEUROPHYSIOLOGY IV (NPH400T/R) PROJECT ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)
Electro-encephalogram, polysomnography, evoked potential recordings, electromyography. Neurography. (Total tuition time: not available)

NEUROPHYSIOLOGY: BIOMEDICAL APPARATUS III (NPB310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Electro-encephalogram, polysomnography, evoked potential recordings, electromyography. (Total tuition time: not available)

NEUROPHYSIOLOGY: CLINICAL PRACTICE III (NPC310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Electro-encephalogram investigations, sleep recordings, polygraphic recordings, visual and somatosensory evoked potential studies, electromyographic studies. (Total tuition time: not available)

NEUROPHYSIOLOGY: CLINICAL TECHNOLOGY WORK-INTEGRATED LEARNING PRACTICE III (EXP3NPC)
(Subject custodian: Department of Biomedical Sciences)
Practice-based competency tests of all the relevant neurophysiological procedures and skills. (Total tuition time: not available)
ORGAN AND SYSTEM PATHOPHYSIOLOGY II (OSA200T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)

PARASITOLOGY IV (PRY401T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
The ecological and epidemiological principles that have an influence on the occurrence and distribution of parasites in Southern Africa. The population dynamics of parasites. Principles of integrated pest control. The prevention of pollution and biological resistance against chemical pesticides. Project. (Total tuition time: ± 90 hours)

PATHOPHYSIOLOGY II (PPT201T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
The disruption of the normal physiological functions of the body, and the processes that lead to disruption. To understand these processes, the individual sciences of histopathology, microbiology, haematology and chemical pathology are combined in an integral concept. (Total tuition time: ± 90 hours)

PERFUSION IV (PRF400T/R) PROJECT ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)
Physiological calculations of flow rates, physiological fluids. Effects of temperature changes, monitoring: pre-, intra- and post-cardiac drugs. Cardioplegia, perfusion of different organs, tissue changes, blood physiology, pathology of cardiopulmonary bypass on different organs, flow dynamics, blood conservation, different perfusions, paediatric perfusion. (Total tuition time: not available)

PERFUSION: BIOMEDICAL APPARATUS III (PBD310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Heart-lung machines, flow meters, vaporisers, thermometers, heating-cooling systems, safety apparatus, cardioplegia, oxygenators, cardiotomy reservoirs, filters, tubing, pressure monitoring systems, cannulas, suckers, sterilisation, blood gas and electrolyte analysers, draining systems, balloon pumps. (Total tuition time: not available)

PERFUSION: CLINICAL PRACTICE III (PFP310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Determining the layout of the heart-lung machine, physiology of perfusion, laboratory equipment, emergency procedures, parameters during ECC. (Total tuition time: not available)

PERFUSION: CLINICAL TECHNOLOGY PRACTICE III (EXP3PFP) WORK-INTEGRATED LEARNING
(Subject custodian: Department of Biomedical Sciences)
Practice-based competency tests of all the relevant perfusion procedures and skills. (Total tuition time: not available)

PHARMACOLOGY II (PMC200T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Pharmaceutical Sciences)
Pharmacokinetics. Pharmacodynamics. Drug dosages, drug interactions, undesirable effects of drugs and medicines. Legislation. Primary health-care. (Total tuition time: not available)

PHARMACOLOGY AND TOXICOLOGY IV (PTX401T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Administration routes. Basic principles of toxicology. Sampling, handling and analytical techniques. (Total tuition time: ± 90 hours)
PHYSICS IB (PHU161C)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Physics)*
A general physics qualification with applications in the biological sciences: remedial mathematics, fundamental units, vectors and scalars, kinetics, mechanics, dynamics, momentum, work, energy and power, fluids, temperature and heat, gas laws, waves and sound, optics, electricity, magnetism, radioactivity. Practical: experiments related to the theory. (Total tuition time: ± 90 hours)

PHYSICS IB: EXTENDED (FPPLS01)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Physics)*
A general physics qualification with applications in the biological sciences: remedial mathematics, fundamental units, vectors and scalars, kinetics, mechanics, dynamics, momentum, work, energy and power, fluids, temperature and heat, gas laws, waves and sound, optics, electricity, magnetism, radioactivity. Practical: experiments related to the theory. (Total tuition time: ± 160 hours)

PHYSIOLOGY I (PSO100B)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Biomedical Sciences)*
Introduction to homeostasis. Cytology (cell membrane, membrane transport mechanisms, organelles). Nervous system (neural tissue, action potentials, synapses, neurotransmitters, spinal cord functions, brain area functions, cranial and spinal nerves, cerebrospinal fluid. Sensory system (sensory concepts, skin-based receptors, pain perception, gustation, olfaction, hearing, equilibrium, vision). Endocrinology (hypothalamus, pituitary gland, thyroid gland, parathyroid glands, adrenal cortex, adrenal medulla, pancreas, bone growth, ossification mechanisms, healing of fractures). Male reproductive system (spermatogenesis, hormonal control). Female reproductive system (oogenesis, menstrual cycle, fertilisation, implantation, hormonal changes during pregnancy, menopause). Cardiovascular system (cardiac conduction system, chronotropic effects, vascular blood flow, blood pressure, physiological shock, lymph flow, hemopoiesis, ABO blood groups, hemostasis). Immunology (inflammation, lymphocytes). Respiratory system (ventilation, external respiration, gaseous transport, internal respiration, neural control of ventilation). Urinary system (renal circulation, urine formation, water balance, micturition). Digestive system (gastrointestinal tract wall, digestion and absorption of nutrients). (Total tuition time: ± 100 hours)

PHYSIOLOGY I (PSO100C)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Biomedical Sciences)*

PRINCIPLES OF MANAGEMENT I (PMR101T)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Management and Entrepreneurship)*
Managers and management, planning, organisation, leading, control, decision-making, motivation, leadership and supervision, communication, coordination, human resource management, financial management, entrepreneurship, marketing management, legal aspects of contracts, business plan. (Total tuition time: not available)

PROJECT: VETERINARY TECHNOLOGY IV (PJA401T/R) PROJECT ASSESSMENT
*(Subject custodian: Department of Biomedical Sciences)*
Project. Students must submit a protocol and a final report. (Total tuition time: six months)

PROTOZOOLOGY III (PZY301T)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Biomedical Sciences)*
Identification of parasitic protozoa and recognition of the diseases they cause in food animals and pets. Diagnostic characteristics, life cycles, pathology, prevention and control. Laboratory techniques are introduced. (Total tuition time: ± 90 hours)

PSYCHO-DYNAMICS I (PDY101T)  1 X 3-HOUR PAPER
*(Subject custodian: Department of Biomedical Sciences)*
Professionalism, ethics, developmental psychology, patient-care, applied psychology. (Total tuition time: not available)
PSYCHO-DYNAMICS OF PATIENT MANAGEMENT I (PPM100T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Professionalism, ethics, developmental psychology and applied psychology. (Total tuition time: ± 102 hours)

PULMONOLOGY IV (PUL400T/R) PROJECT ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)

PULMONOLOGY: BIOMEDICAL APPARATUS III (PBP310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Spirometry, flow measuring devices, transducers, transcutaneous monitoring, gas chromatography, mass spectrometry, thermal conductive detectors, analysers (optical transmission, infrared, paramagnetic, Geissler tube, blood gas), lung functions, whole-body plethysmography, bronchoscopy. (Total tuition time: not available)

PULMONOLOGY: CLINICAL PRACTICE III (KPU310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Sterilisation, electrical safety, gas laws, lung volumes, ventilation, spirogram, flow-volume curves, lung scans, whole-body plethysmography, diffusion, bronchodilators, bronchoscopy. (Total tuition time: not available)

PULMONOLOGY: CLINICAL TECHNOLOGY PRACTICE III (EXP3KPU) WORK-INTEGRATED LEARNING
(Subject custodian: Department of Biomedical Sciences)
Practice-based competency tests of all the relevant pulmonological procedures and skills. (Total tuition time: not available)

RADIATION SCIENCE: IMAGE RECORDING I (RSC10QT) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Basic theory of the facets of the imaging process in a conventional and digital radiographic environment. (Total tuition time: ± 102 hours)

RADIATION SCIENCE: IMAGE RECORDING III(D) (RSC30QT) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
More advanced theory and practice of image recording and its application to diagnostic radiography, such as duplication, photographic subtraction, macroradiography, quality assurance, fluoroscopy, photofluorography, digital radiography, wet and dry laser printer. (Total tuition time: ± 94 hours)

RADIATION SCIENCE: IMAGE RECORDING, ULTRASOUND AND RADIOBIOLOGY II (RSC22QT) 2 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
More advanced theory and practice of image recording in diagnostic radiography, such as sensitometry, luminescence exposure factors. Basic principles of ultrasound and the introduction to radiobiology. (Total tuition time: ± 155 hours)

RADIATION SCIENCE: PHYSICS AND CHEMISTRY I (RSC10PT) 1 X 3-HOUR PAPER
(Subject custodian: Department of Physics)
Principles of mechanics, heat, optics and electricity that form a basis for Radiation Science II and Radiation Science III(D). Basic introduction to chemistry and concepts of the structure of matter. (Total tuition time: ± 102 hours)

RADIATION SCIENCE: RADIATION PHYSICS AND PROTECTION AND EQUIPMENT II (RSC22PT) 2 X 3-HOUR PAPER
(Subject custodian: Department of Physics)
Electricity supply to X-ray machines, X-ray tube designs, including X-ray circuitry and imaging components. The atomic structure and electromagnetic rays. The excitation of X-rays, attenuation and interaction of radiation with matter, radiation risks and radiation protection in all X-ray departments. (Total tuition time: ± 155 hours)
RADIATION SCIENCE: SPECIALISED EQUIPMENT III(D) (RSC30PT) 1 X 3-HOUR PAPER
(Subject custodian: Department of Physics)
Specialised X-ray tubes and utility purposes. Specialised equipment for dentistry, mammography, fluoroscopic, tomographic, magnetic resonance imaging. Digital equipment as applicable to conventional radiography and tomography. Principles of quality control. (Total tuition time: ± 94 hours)

RADIOGRAPHIC MANAGEMENT III(D) (RGM300T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Management and Entrepreneurship)
The principles of management and administration of a diagnostic imaging department, stock control and planning. Basic managerial skills and techniques. (Total tuition time: ± 75 hours)

RADIOGRAPHIC PATHOLOGY II (RGP200T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
A study of disease processes in the different body systems, with special emphasis on the radiographic appearance of diseases. (Total tuition time: ± 177 hours)

RADIOGRAPHIC PRACTICE I (RPR100T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Basic principles of diagnostic radiographic technique, including routine projections of structures of the body. Introduction to radiation oncology, nuclear medicine and ultrasound. The general responsibility of a radiographer towards the patient. (Total tuition time: ± 204 hours)

RADIOGRAPHIC PRACTICE II (RPR200T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Specialised radiographic technique for the demonstration of specific anatomical structures and pathology, including fluoroscopic technique as well as adaptations for emergency patients. (Total tuition time: ± 221 hours)

RADIOGRAPHIC PRACTICE III(D) (RPR300T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Advanced integrated radiographic technique, including specialised imaging modalities, procedures and application of basic pattern recognition skills. (Total tuition time: ± 262 hours)

RADIOGRAPHIC PRACTICE IV(D) (PRP400T) 2 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Application and integration of advanced imaging modalities and procedures, quality management processes and pattern recognition. Acquiring innovative learning methods like case studies and presentation. (Total tuition time: ± 109 hours)

RECOMBINANT DNA TECHNOLOGY IV (RDT401T) 2 X 2-HOUR PAPER
(Subject custodian: Department of Biotechnology and Food Technology)
An in-depth handling of recombinant DNA technology as the foundation for modern biotechnology. Topics discussed include restriction modification enzymes, hybridisation, cloning and cloning vectors, sequencing, polymerase chain reaction, genome projects, gene manipulations, genomic and cDNA libraries, DNA delivery methods, expression of cloned genes in E. coli & prokaryotes, products made using genetic engineering. Bioinformatics and analysis of biological data using computer software will be introduced. The students will gain in-depth knowledge and hands-on laboratory/industrial skills required for direct employment or for creation of employment in an industry dealing with this subject matter. (Total tuition time: ± 144 hours)

REPRODUCTION: BIOMEDICAL APPARATUS III (RBA310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Laboratory equipment. Functioning of a computer-assisted sperm analysis (CASA) system. Microscopes. Photographic and videographic equipment. Maintenance of equipment. (Total tuition time: not available)

REPRODUCTION: CLINICAL PRACTICE III (KRE310T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Laboratory safety. Computer-assisted sperm analysis (CASA). Biomedical statistics, word processing and data management, sterility and quality control in the workplace, ethics and handling of laboratory animals, handling of chemicals in the reproductive biology laboratory. (Total tuition time: not available)
REPRODUCTION: CLINICAL TECHNOLOGY  WORK-INTEGRATED LEARNING
PRACTICE III (EXP3KRE)

Subject custodian: Department of Biomedical Sciences
Practice-based competency tests of all the relevant reproductive procedures and skills. (Total tuition time: not available)

REPRODUCTION TECHNOLOGY IV (RPT401T)  1 X 3-HOUR PAPER
Subject custodian: Department of Biomedical Sciences
Practical and theoretical knowledge of the anatomy and physiology of the reproduction systems of animals. The application of semen technology, including semen preservation, semen evaluation and artificial insemination. Embryo technology involves all aspects of fertilisation, embryo development and implantation, maintenance of pregnancy and assistance with parturis. (Total tuition time: ± 90 hours)

REPRODUCTIVE BIOLOGY IV (RBY400T/R) PROJECT ASSESSMENT
Subject custodian: Department of Biomedical Sciences

RESEARCH METHODOLOGY: NATURAL SCIENCES (RMN201B)  1 X 3-HOUR PAPER
Subject custodians: Departments of Biomedical Sciences
Purpose, nature and meaning of research, basic structure of a research proposal. Identify a research problem, literature review, research aims, objectives and hypotheses, research design types, sampling procedures, reliability and validity, research budget and research funding, types of quantitative data, basic principles of non-parametric tests. Introduction to descriptive statistics and probability (p-values) and hypothesis testing. Introduction to inferential statistics (student’s t-test, ANOVA and correlations). Introduction to epidemiological data. Interpretation of graphs and tables. Basic principles of research ethics. Dissemination of research findings. (Total tuition time: One full block week: ± 40 hours)

RESEARCH METHODS AND TECHNIQUES (RMQ200C)  1 X 3-HOUR PAPER
Subject custodian: Department of Biomedical Sciences
Theory of basic research, methodological principles and completion of a proposal. A student will only be allowed to register for Radiographic Practice IV (PRP400T) once a proposal for the research project has been approved at appropriate committees at the University. (Total tuition time: ± 54 hours)

RESEARCH METHODS AND TECHNIQUES (RMQ201T)  1 X 3-HOUR PAPER
Subject custodian: Department of Biomedical Sciences
Data collection. Data processing. Reporting: papers and seminars. Statistical methods: descriptive statistics, probability, inference, confidence intervals, parametric and distribution-free tests, analysis of variance, experimental design, correlation and regression. Project. (Total tuition time: ± 60 hours)

VETERINARY BACTERIOLOGY IV (VTB401T) CONTINUOUS ASSESSMENT
Subject custodian: Department of Biomedical Sciences
The more important pathogenic bacteria, mycoplasmas and fungi of veterinary importance that are covered with respect to isolation, identification and symptoms. Advanced techniques. Project. (Total tuition time: ± 90 hours)
VETERINARY ENTOMOLOGY III (VTE301T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Identification of parasitic insects and the recognition of diseases transferred and caused by them. Life cycles of insects and environmental factors that influence those cycles. Prevention and control, as well as chemical control. Acarology (ticks and mites). (Total tuition time: ± 90 hours)

VETERINARY MICROBIOLOGY III (VTM301T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)
Micro-organisms (bacteria and fungi) that cause veterinary diseases. Emphasis is placed on the isolation and identification of organisms. (Total tuition time: ± 90 hours)

VIROLOGY III (VIR311T) 1 X 3-HOUR PAPER
(Subject custodian: Department of Biomedical Sciences)

VIROLOGY IV (VIR401T) CONTINUOUS ASSESSMENT
(Subject custodian: Department of Biomedical Sciences)

WORK-INTEGRATED LEARNING (EXP1VET) WORK-INTEGRATED LEARNING
(Subject custodian: Department of Biomedical Sciences)
A training programme is drawn up in collaboration with the supervisor at an accredited laboratory. (Total tuition time: six months)