



# University of Pretoria Yearbook 2016

## BScAgric Animal Science: Pasture Science (03130250)

**Duration of study** 4 years

**Total credits** 582

### Admission requirements

- In order to register NSC/IEB/Cambridge candidates must comply with the minimum requirements for degree studies as well as the minimum requirements for the relevant study programme.
- Life Orientation is excluded in the calculation of the Admission Point Score (APS).
- Grade 11 results are used for the provisional admission of prospective students. Final admission is based on the Grade 12 results.

Minimum requirements for 2016												
Achievement level												
Afrikaans or English				Mathematics				Physical Sciences				APS
NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	NSC/IEB	HIGCSE	AS-Level	A-Level	
5	3	C	C	5	3	C	C	5	3	C	C	30

Candidates who do not comply with the minimum admission requirements may be considered for admission to the BScAgric or the BSc (Four-year Programme) based on the results of the NBT. Please note that students who are placed in the BSc (Four-year Programme) will take a minimum of five years to complete the BSc Agric study programme.

### Other programme-specific information

Students may enrol for AIM 111 and AIM 121 instead of AIM 101 (the same content presented over 2 semesters).

#### Compilation of curriculum

Students must register for elective modules in consultation with the head of department who must ensure that the modules do not clash on the set timetable.

The Dean may, in exceptional cases and on recommendation of the head of department, approve deviations from the prescribed curriculum.



## Promotion to next study year

A student will be promoted to the following year of study if he or she passed 100 credits of the prescribed credits for a year of study, unless the Dean on the recommendation of the head of department decides otherwise. A student who does not comply with the requirements for promotion to the following year of study, retains the credit for the modules already passed and may be admitted by the Dean, on recommendation of the head of department, to modules of the following year of study to a maximum of 48 credits, provided that it will fit in with both the lecture and examination timetable.

## Pass with distinction

The BScAgric degree is conferred with distinction if a student obtains a weighted average of at least 75% in the modules of the major subjects in the third and the fourth year of study, with a weighted average of at least 65% in the other modules of the third and the fourth year of study.



## Curriculum: Year 1

Minimum credits: 140

### Fundamental modules

#### Academic information management 111 (AIM 111)

**Module credits** 4.00

**Service modules**

Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Economic and Management Sciences  
Faculty of Humanities  
Faculty of Law  
Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences  
Faculty of Theology

**Prerequisites** No prerequisites.

**Contact time** MAMELODI, 2 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Information Science

**Period of presentation** Semester 1

**Module content**

Find, evaluate, process, manage and present information resources for academic purposes using appropriate technology.

#### Academic information management 121 (AIM 121)

**Module credits** 4.00

**Service modules**

Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Economic and Management Sciences  
Faculty of Humanities  
Faculty of Law  
Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences  
Faculty of Theology  
Faculty of Veterinary Science

**Prerequisites** No prerequisites.

**Contact time** 2 lectures per week, MAMELODI

**Language of tuition** Both Afr and Eng

**Academic organisation** Information Science

**Period of presentation** Semester 2



### Module content

Apply effective search strategies in different technological environments. Demonstrate the ethical and fair use of information resources. Integrate 21st-century communications into the management of academic information.

### Language and study skills 110 (LST 110)

**Module credits** 6.00

**Service modules** Faculty of Natural and Agricultural Sciences  
Faculty of Veterinary Science

**Prerequisites** No prerequisites.

**Contact time** 2 lectures per week

**Language of tuition** English

**Academic organisation** Unit for Academic Literacy

**Period of presentation** Semester 1

### Module content

The module aims to equip students with the ability to cope with the reading and writing demands of scientific disciplines.

### Academic orientation 102 (UPO 102)

**Module credits** 0.00

**Language of tuition** Double Medium

**Academic organisation** Natural + Agric Sciences Dean

**Period of presentation** Year

### Academic information management 102 (AIM 102)

**Module credits** 6.00

**Service modules** Faculty of Education  
Faculty of Economic and Management Sciences  
Faculty of Humanities  
Faculty of Law  
Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences  
Faculty of Theology  
Faculty of Veterinary Science

**Contact time** 2 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Information Science

**Period of presentation** Semester 2



## Module content

Find, evaluate, process, manage and present information resources for academic purposes using appropriate technology. Apply effective search strategies in different technological environments. Demonstrate the ethical and fair use of information resources. Integrate 21st-century communications into the management of academic information.

## Core modules

### Biometry 120 (BME 120)

**Module credits** 16.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Natural and Agricultural Sciences  
Faculty of Veterinary Science

**Prerequisites** At least 4 (50-59%) in Mathematics in the Grade 12 examination, or at least 50% in both Statistics 113, 123

**Contact time** 1 practical per week, 4 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Statistics

**Period of presentation** Semester 2

## Module content

Simple statistical analysis: Data collection and analysis: Samples, tabulation, graphical representation, describing location, spread and skewness. Introductory probability and distribution theory. Sampling distributions and the central limit theorem. Statistical inference: Basic principles, estimation and testing in the one- and two-sample cases (parametric and non-parametric). Introduction to experimental design. One- and twoway designs, randomised blocks. Multiple statistical analysis: Bivariate data sets: Curve fitting (linear and non-linear), growth curves. Statistical inference in the simple regression case. Categorical analysis: Testing goodness of fit and contingency tables. Multiple regression and correlation: Fitting and testing of models. Residual analysis. Computer literacy: Use of computer packages in data analysis and report writing.

### Plant biology 161 (BOT 161)

**Module credits** 8.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education

**Prerequisites** MLB 111 GS

**Contact time** fortnightly practicals, 2 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Plant and Soil Sciences

**Period of presentation** Semester 2



## Module content

Basic plant structure and function; introductory plant taxonomy and plant systematics; principles of plant molecular biology and biotechnology; adaptation of plants to stress; medicinal compounds from plants; basic principles of plant ecology and their application in natural resource management.

## General chemistry 117 (CMY 117)

**Module credits** 16.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Health Sciences  
Faculty of Veterinary Science

**Prerequisites** Final Grade 12 marks of at least 60% for Mathematics and 60% for Physical Sciences.

**Contact time** 1 practical per week, 4 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Chemistry

**Period of presentation** Semester 1

## Module content

General introduction to inorganic, analytical and physical chemistry. Atomic structure and periodicity. Molecular structure and chemical bonding using the VSEOR model. Nomenclature of inorganic ions and compounds. Classification of reactions: precipitation, acid-base, redox reactions and gas-forming reactions. Mole concept and stoichiometric calculations concerning chemical formulas and chemical reactions. Principles of reactivity: energy and chemical reactions. Physical behaviour gases, liquids, solids and solutions and the role of intermolecular forces. Rate of reactions: Introduction to chemical kinetics.

## General chemistry 127 (CMY 127)

**Module credits** 16.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Health Sciences  
Faculty of Veterinary Science

**Prerequisites** Natural and Agricultural Sciences students: CMY 117 GS or CMY 154 GS Health Sciences students: none

**Contact time** 1 practical per week, 4 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Chemistry

**Period of presentation** Semester 2



## Module content

Theory: General physical-analytical chemistry: Physical behaviour of gases, liquids and solids, intermolecular forces, solutions. Principles of reactivity: energy and chemical reactions, entropy and free energy, electrochemistry. Organic chemistry: Structure (bonding), nomenclature, isomerism, introductory stereochemistry, introduction to chemical reactions and chemical properties of organic compounds and biological compounds, i.e. carbohydrates and amino acids. Practical: Molecular structure (model building), synthesis and properties of simple organic compounds.

## Introductory genetics 161 (GTS 161)

**Module credits** 8.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Veterinary Science

**Prerequisites** MLB 111 GS

**Contact time** fortnightly practicals, 2 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Genetics

**Period of presentation** Semester 2

## Module content

Chromosomes and cell division. Principles of Mendelian inheritance: locus and alleles, dominance interactions and epistasis. Probability studies. Sex determination and sex linked traits. Pedigree analysis. Extranuclear inheritance. Genetic linkage and chromosome mapping. Chromosome variation.

## Introduction to microbiology 161 (MBY 161)

**Module credits** 8.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology

**Prerequisites** MLB 111 GS

**Contact time** 2 lectures per week, 1 practical per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Microbiology and Plant Path

**Period of presentation** Semester 2

## Module content

The module will introduce the student to the field of Microbiology. Basic Microbiological aspects that will be covered include introduction into the diversity of the microbial world (bacteria, archaea, eukaryotic microorganisms and viruses), basic principles of cell structure and function, microbial nutrition and microbial growth and growth control. Applications in Microbiology will be illustrated by specific examples i.e. bioremediation, animal-microbial symbiosis, plant-microbial symbiosis and the use of microorganisms in industrial microbiology. Wastewater treatment, microbial diseases and food will be introduced using specific examples.



## Molecular and cell biology 111 (MLB 111)

**Module credits** 16.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Health Sciences  
Faculty of Veterinary Science

**Prerequisites** Refer to Regulation 1.2: A candidate who has passed Mathematics with at least 50% in the Grade 12 examination

**Contact time** 4 lectures per week, 1 practical per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Genetics

**Period of presentation** Semester 1

### Module content

Introductory study of the ultra structure, function and composition of representative cells and cell components. General principles of cell metabolism, molecular genetics, cell growth, cell division and differentiation.

## Physics for biology students 131 (PHY 131)

**Module credits** 16.00

**Service modules** Faculty of Education  
Faculty of Health Sciences  
Faculty of Veterinary Science

**Prerequisites** Refer to Regulation 1.2: A candidate must have passed Mathematics with at least 50% in the Grade 12 examination

**Contact time** 1 practical per week, 4 lectures per week, 1 discussion class per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Physics

**Period of presentation** Semester 1

### Module content

Units, vectors, one dimensional kinematics, dynamics, work, equilibrium, sound, liquids, heat, thermodynamic processes, electric potential and capacitance, direct current and alternating current, optics, modern physics, radio activity.

## Mathematics 134 (WTW 134)

**Module credits** 16.00

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Veterinary Science

**Prerequisites** Refer to Regulation 1.2: At least 50% for Mathematics in the Grade 12 examination .





**Contact time** 4 lectures per week, 1 tutorial per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Mathematics and Applied Maths

**Period of presentation** Semester 1

### Module content

*\*Students will not be credited for more than one of the following modules for their degree: WTW 134, WTW 165, WTW 114, WTW 158. WTW 134 does not lead to admission to Mathematics at 200 level and is intended for students who require Mathematics at 100 level only. WTW 134 is offered as WTW 165 in the second semester only to students who have applied in the first semester of the current year for the approximately 65 MBChB, or the 5-6 BChD places becoming available in the second semester and who were therefore enrolled for MGW 112 in the first semester of the current year.* Functions, derivatives, interpretation of the derivative, rules of differentiation, applications of differentiation, integration, interpretation of the definite integral, applications of integration. Matrices, solutions of systems of equations. All topics are studied in the context of applications.

## Animal diversity 161 (ZEN 161)

**Module credits** 8.00

**Service modules** Faculty of Education  
Faculty of Veterinary Science

**Prerequisites** MLB 111 GS or TDH

**Contact time** 2 lectures per week, fortnightly practicals

**Language of tuition** Both Afr and Eng

**Academic organisation** Zoology and Entomology

**Period of presentation** Semester 2

### Module content

Animal classification, phylogeny, organization and terminology. Evolution of the various animal phyla, morphological characteristics and life cycles of parasitic and non-parasitic animals. Structure and function of reproductive, respiratory, excretory, circulatory and digestive systems.



## Curriculum: Year 2

Minimum credits: 167

### Core modules

#### Introduction to proteins and enzymes 251 (BCM 251)

**Module credits** 12.00

**Service modules** Faculty of Health Sciences

**Prerequisites** [CMY117 GS] and [CMY127 GS] and [MLB111 GS]

**Contact time** 2 lectures per week, 90 minute practical per week

**Language of tuition** Double Medium

**Academic organisation** Biochemistry

**Period of presentation** Semester 1

#### Module content

Structural and ionic properties of amino acids. Peptides, the peptide bond, primary, secondary, tertiary and quaternary structure of proteins. Interactions that stabilise protein structure, denaturation and renaturation of proteins. Introduction to methods for the purification of proteins, amino acid composition, and sequence determinations. Introduction to enzyme kinetics and enzyme inhibition. Allosteric enzymes, regulation of enzyme activity, active centres and mechanisms of enzyme catalysis. Examples of industrial applications of enzymes. Practical training in laboratory techniques and Good Laboratory Practice. Techniques for the quantitative and qualitative analysis of biological molecules. Processing and presentation of scientific data.

#### Carbohydrate metabolism 252 (BCM 252)

**Module credits** 12.00

**Service modules** Faculty of Education  
Faculty of Health Sciences

**Prerequisites** [CMY117 GS] and [CMY127 GS] and [MLB111 GS]

**Contact time** 90 minute practical per week, 2 lectures per week

**Language of tuition** Double Medium

**Academic organisation** Biochemistry

**Period of presentation** Semester 1

#### Module content

Biochemistry of carbohydrates. Thermodynamics and bioenergetics. Glycolysis, citric acid cycle and electron transport. Glycogen metabolism, pentose-phosphate pathway, gluconeogenesis and photosynthesis. Practical training in study and analysis of metabolic pathways and enzymes. Scientific method and design: Hypothesis design and testing, method design and scientific controls.

#### Lipid and nitrogen metabolism 261 (BCM 261)

**Module credits** 12.00



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<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	[CMY117 GS] and [CMY127 GS] and [MLB111 GS]
<b>Contact time</b>	90 minute practical per week, 2 lectures per week
<b>Language of tuition</b>	Double Medium
<b>Academic organisation</b>	Biochemistry
<b>Period of presentation</b>	Semester 2

### Module content

Biochemistry of lipids, membrane structure, anabolism and catabolism of lipids. Nitrogen metabolism, amino acid biosynthesis and catabolism. Biosynthesis of neurotransmitters, pigments, hormones and nucleotides from amino acids. Catabolism of purines and pyrimidines. Therapeutic agents directed against nucleotide metabolism. Examples of inborn errors of metabolism of nitrogen containing compounds. The urea cycle, nitrogen excretion. Practical training in scientific writing skills: evaluation of a scientific report. Techniques for separation and analysis of biological molecules

## Biochemical principles of nutrition and toxicology 262 (BCM 262)

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	[CMY117 GS] and [CMY127 GS] and [MLB111 GS]
<b>Contact time</b>	90 minute practical per week, 2 lectures per week
<b>Language of tuition</b>	Double Medium
<b>Academic organisation</b>	Biochemistry
<b>Period of presentation</b>	Semester 2

### Module content

Biochemistry of nutrition and toxicology. Proximate analysis of nutrients. Review of energy requirements and expenditure. Respiratory quotient. Requirements and function of water, vitamins and minerals. Interpretation and modification of RDA values for specific diets, eg growth, exercise, pregnancy and lactation, aging and starvation. Interactions between nutrients. Comparison of monogastric and ruminant metabolism. Cholesterol, polyunsaturated, essential fatty acids and dietary anti-oxidants. Oxidation of fats. Biochemical mechanisms of water- and fat-soluble vitamins and assessment of vitamin status. Mineral requirements, biochemical mechanisms, imbalances and diarrhoea. Biochemistry of xenobiotics: absorption, distribution, metabolism and excretion (ADME); detoxification reactions: oxidation/reduction (Phase I), conjugations (Phase II), export from cells (Phase III); factors affecting metabolism and disposition. Toxic responses: tissue damage and physiological effects, teratogenesis, immunotoxicity, mutagenesis and carcinogenesis. Examples of toxins: biochemical mechanisms of common toxins and their antidotes. Antibiotics and resistance. Natural toxins from fungi, plants and animals: goitrogens, cyanogens, cholinesterase inhibitors, ergotoxin, aflatoxins Practical training in analyses of nutrients, fatty acids separations, antioxidant determination, and enzyme activity measurements, PO ratio of mitochondria, electrophoresis, extraction, solubility and gel permeation techniques.

## South African flora and vegetation 251 (BOT 251)

<b>Module credits</b>	12.00
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<b>Service modules</b>	Faculty of Education
<b>Prerequisites</b>	BOT 161 or TDH
<b>Contact time</b>	1 practical per week, 2 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant and Soil Sciences
<b>Period of presentation</b>	Semester 1

### Module content

Origin and affinity of South African flora and vegetation types; principles of plant geography; plant diversity in southern Africa; characteristics, environments and vegetation of South African biomes and associated key ecological processes; centre of plant endemism; rare and threatened plant species; biodiversity conservation and ecosystem management; invasion biology; conservation status of South African vegetation types.

## Plant physiology and biotechnology 261 (BOT 261)

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Education
<b>Prerequisites</b>	BOT 161, CMY 117, CMY 127 or TDH
<b>Contact time</b>	2 lectures per week, 1 practical per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant and Soil Sciences
<b>Period of presentation</b>	Semester 2

### Module content

Nitrogen metabolism in plants; nitrogen fixation in Agriculture; plant secondary metabolism and natural products; photosynthesis and carbohydrate metabolism in plants; applications in solar energy; plant growth regulation and the Green Revolution; plant responses to the environment; developing drought tolerant and disease resistant plants.

## Animal anatomy and physiology 200 (DAF 200)

<b>Module credits</b>	36.00
<b>Prerequisites</b>	CMY 127 or TDH
<b>Contact time</b>	4 lectures per week, 1 practical per week
<b>Language of tuition</b>	English
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Year



## Module content

General structure and plan of the body of livestock. Types and characteristics of cells and tissues. Body water. Anatomy, physiology and histology of systems: Skin; skeleton; muscles, connective tissue, ligaments, joints; nervous system; sensory organs of sight, sound, smell, touch, taste; circulatory system; respiratory system; endocrinology; male and female reproductive systems; digestive system, gastrointestinal tract, liver, pancreas; kidneys, acid-base balance and homeostasis; lactation; immune system. General species differences.

## Introductory soil science 250 (GKD 250)

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology
<b>Prerequisites</b>	CMY 117 GS or TDH
<b>Contact time</b>	1 practical per week, 3 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant Production and Soil Sc
<b>Period of presentation</b>	Semester 1

## Module content

Origin and development of soil, weathering and soil formation processes. Profile differentiation and morphology. Physical characteristics: texture, structure, soil water, atmosphere and temperature. Chemical characteristics: clay minerals, ion exchange, pH, buffer action, soil acidification and salinisation of soil. Soil fertility and fertilisation. Soil classification. Practical work: Laboratory evaluation of simple soil characteristics. Field practicals on soil formation in the Pretoria area.

## Genetic diversity and evolution 261 (GTS 261)

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education
<b>Prerequisites</b>	GTS 251 GS
<b>Contact time</b>	2 lectures per week, fortnightly practicals
<b>Language of tuition</b>	English
<b>Academic organisation</b>	Genetics
<b>Period of presentation</b>	Semester 2

## Module content

Chromosome structure and transposable elements. Mutation and DNA repair. Genomics and proteomics. Organelle genomes. Introduction to genetic analysis of populations: allele and genotypic frequencies, Hardy Weinberg Law, its extensions and implications for different mating systems. Introduction to quantitative and evolutionary genetics.

## Sustainable crop production and agroclimatology 251 (PPK 251)

<b>Module credits</b>	15.00
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<b>Prerequisites</b>	BOT 161
<b>Contact time</b>	3 lectures per week, fortnightly practicals
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant Production and Soil Sc
<b>Period of presentation</b>	Semester 2

#### Module content

Influence of climate on cropping systems in South Africa. The surface energy balance. Hydrological cycles and the soil water balance. Sustainable crop production. Simple radiation and water limited models. Potential yield, target yield and maximum economic yield. Crop nutrition and fertiliser management. Principles of soil cultivation and conservation. Climate change and crop production – mitigation and adaptation.

### Animal science 250 (VKU 250)

<b>Module credits</b>	12.00
<b>Contact time</b>	2 lectures per week, 1 practical per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Origin and domestication of farm and companion animals. The ecological environment in which animal production and development is practised. Animal ecological factors that influence regional classification. Livestock species, breeds and breed characterisation and genetic variation. Basic principles of nutrition, physiology, breeding and production organisation of the livestock industry and relevant legislation. Practical work includes identification and classification of different breeds of livestock, as well as the general care and handling of farm stock.

### Animal Science 260 (VKU 260)

<b>Module credits</b>	12.00
<b>Prerequisites</b>	VKU 250 GS or TDH
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 2



## **Module content**

Livestock ecology, interaction between genotype and environment. Production regions and systems. Animal ecological factors to be considered in production factors, planning and management of different livestock production systems. Applied principles of livestock production, production management and systems (large livestock, small stock, pigs and poultry). Conservation farming and adapted farming and management systems; environmental conservation. Practical work will consist of compulsory farm practical during vacation after the 1st year and or during the 2nd year of study in order to understand different animal production systems as well as the general care and handling of farm stock.



## Curriculum: Year 3

Minimum credits: 130

### Core modules

#### Animal anatomy 310 (DAN 310)

<b>Module credits</b>	8.00
<b>Prerequisites</b>	DAF 200
<b>Contact time</b>	1 lecture per week, fortnightly practicals
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Functional anatomy, growth and development of tissues and organ systems. Changes during maturation, reproduction, the post-partum period and lactation. Ageing and tissue changes with erosion diseases. The influence of hormones, production and reproduction on conformation and a critical evaluation of assessment of animals for functional efficiency.

#### Animal physiology 311 (DFS 311)

<b>Module credits</b>	10.00
<b>Prerequisites</b>	DAF 200
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Homeostasis and Homeorhesis in animals: Thermoregulation. Adaptation of glucose, lipid and protein metabolism in response to short and long-term changes in the supply and balance of nutrients and to changes in tissue demand for nutrients during different physiological states. Deviations from normal homeostasis, metabolic diseases and the prevention thereof. Pathogenesis of inflammation and infections; immunity.

#### Growth physiology 320 (DFS 320)

<b>Module credits</b>	10.00
<b>Prerequisites</b>	DFS311 + DAN 310
<b>Contact time</b>	fortnightly practicals, 2 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 2





## Module content

The underlying physiological processes in growth and development. Pre- and postnatal growth and factors which determine growth rate: growth curves, stimulants of growth, age, nutrition, race, gender, et al.

## Introduction to agricultural economics 210 (LEK 210)

<b>Module credits</b>	12.00
<b>Service modules</b>	Faculty of Economic and Management Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Double Medium
<b>Academic organisation</b>	Agric Econ, Ext + Rural Dev
<b>Period of presentation</b>	Semester 1

## Module content

Introduction to financial management in agriculture: Farm management and agricultural finance, farm management information; analysis and interpretation of farm financial statements; risk and farm planning. Budgets: partial, break-even, enterprise, total, cash flow and capital budgets. Time value of money. Introduction to production and resource use: the agricultural production function, total physical product curve, marginal physical product curve, average physical product curve, stages of production. Assessing short-term business costs; Economics of short-term decisions. Economics of input substitution: Least-cost use of inputs for a given output, short-term least-cost input use, effects of input price changes. Least-cost input use for a given budget. Economics of product substitution. Product combinations for maximum profit. Economics of crop and animal production.

## Reproduction science 310 (RPL 310)

<b>Module credits</b>	8.00
<b>Prerequisites</b>	DAF 200
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 1

## Module content

Theriogenology, spermatogenesis, zoogenesis, the female sexual cycle. Species differences. Hormonal control of the sexual functions.

## Reproduction science 320 (RPL 320)

<b>Module credits</b>	10.00
<b>Prerequisites</b>	RPL 310
<b>Contact time</b>	1 practical per week, 2 lectures per week



**Language of tuition** Both Afr and Eng

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Semester 2

### Module content

Artificial insemination. Semen collection techniques, the evaluation, dilution and conservation of semen. Collection, conservation and transfer of embryos. Collection of ova and in vitro fertilization. Handling of apparatus and practical insemination, oestrus observation and determination of gestation.

## Animal breeding 320 (TLR 320)

**Module credits** 12.00

**Prerequisites** GTS 261

**Contact time** fortnightly practicals, 2 lectures per week

**Language of tuition** Both Afr and Eng

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Semester 2

### Module content

Karyotyping of farm animals; breed and specie differences and the influence on classification of breeds. Influence of chromosomal aberrations. Phenotypic expression of genes and gene-interaction in farm animals. Single gene, major genes and polygenes. Variation in traits of economic importance and statistical description. Use of genetic variation. Estimation of breeding values and family indices on traits determined by single genes. Principles of breeding systems.

## Nutrition science 301 (VGE 301)

**Module credits** 32.00

**Prerequisites** BCM 261 and BCM 262 and DAF 200 and VKU 250 and VKU 260

**Contact time** 3 lectures per week, fortnightly practicals

**Language of tuition** Both Afr and Eng

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Year

### Module content

Digestion and metabolism of feeds. The division of food energy and food energy systems. Protein quality and requirements. Mineral and vitamin requirements. Nutritional standards. Voluntary intake. Characteristics of fodder. Rumen function and microbial fermentation. Practical work: In vivo and in vitro digestibility studies.

## Principles of veld management 310 (WDE 310)

**Module credits** 14.00

**Prerequisites** No prerequisites.

**Contact time** fortnightly practicals, 2 lectures per week



**Language of tuition** Double Medium

**Academic organisation** Plant Production and Soil Sc

**Period of presentation** Semester 1

### Module content

The influence of biotic and abiotic factors on the productivity of different strata and components of natural pastures. This will enable the student to advise users, with the necessary motivation, on the appropriate use of these strata and components and will form a basis for further research on this system. The principles of veld management and the influence of management practices on sustainable animal production from natural pastures. This will enable the student to advise users on veld management and veld management principles. It will also form a basis for further research on veld management.

## Planted pastures and fodder crops 320 (WDE 320)

**Module credits** 14.00

**Prerequisites** WDE 310

**Contact time** 2 lectures per week, fortnightly practicals

**Language of tuition** Double Medium

**Academic organisation** Plant Production and Soil Sc

**Period of presentation** Semester 2

### Module content

The establishment and use of planted pastures species and fodder crops and the conservation of fodder. This will enable students to advise users on establishment and utilization of planted pastures species as well as farmers on the production, conservation and optimum use of fodder. This will also form a basis for further research on planted pastures.



## Curriculum: Final year

**Minimum credits: 136**

### Core modules

#### Soil classification and surveying 350 (GKD 350)

<b>Module credits</b>	14.00
<b>Prerequisites</b>	GKD 250 GS
<b>Contact time</b>	1 practical per week, 2 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant Production and Soil Sc
<b>Period of presentation</b>	Semester 1

#### Module content

A taxonomic system for South Africa. USDA's Soil Taxonomy. Land suitability evaluation. Optimal resource utilization. The conservation component. Ecological aspects. Ecotype, land types. Soil maps. Practical work: Field practicals and compulsory excursion. Identification of soil horizons, forms and families. Land suitability evaluation. Elementary mapping exercise.

#### Large stock nutrition and production 420 (GVK 420)

<b>Module credits</b>	20.00
<b>Prerequisites</b>	RPL 320, VGE 301, VKU 250 and VKU 260
<b>Contact time</b>	1 practical per week, 4 lectures per week
<b>Language of tuition</b>	Double Medium
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 1

#### Module content

Production management of large stock. Aspects of business management of the large-stock enterprise. Management programmes, production systems and techniques applicable to beef cattle, dairy cattle and horses. Specialised nutrition of beef and dairy cattle according to production systems. The use of computer systems in feeding management. Design and planning of farm buildings and structures. Storage and handling of fodder. The handling and management of refuse. Hygiene and herd health programmes. Practical work: This will include compiling rations based on requirements and least cost formulations, specialised assignments and on-farm experiential training.

#### Small stock nutrition and production 420 (KVK 420)

<b>Module credits</b>	20.00
<b>Prerequisites</b>	RPL 320, VGE 301, VKU 250 and VKU 260
<b>Contact time</b>	4 lectures per week, 1 practical per week



**Language of tuition** Double Medium

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Semester 2

### Module content

Specialised small stock and game nutrition. Principles of creep feeding, drought feeding, winter and supplementary feeding. Feeding pen nutrition and final nutritional preparation of lambs. Influence of nutrition on wool, pelts and mohair. Fodder-flow planning. Small stock management, making arrangements for shearing and preparing sheds and equipment, pens, dipping, drinking and feeding facilities. Preparation and marketing of hides, wool, mohair and karakul. Lambing seasons and herd management. Management programmes for the production of wool, meat, karakul pelt and mohair according to the particular ecological region and for conditions of drought. Herd health programmes. Practical work: Formulation of lowest cost rations and practical work with small ruminants.

## Monogastric nutrition and production 411 (VGE 411)

**Module credits** 18.00

**Prerequisites** VGE 301

**Contact time** 1 practical per week, 2 lectures per week

**Language of tuition** Double Medium

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Semester 2

### Module content

Specialised nutrition of monogastric animals: poultry, pigs, horses and selected freshwater aquatic organisms. Pig production and management - sow, boar and growing pigs. Feeding and housing systems. Hygiene and herd health programmes, product quality and marketing. Practical work: The use of computer systems in managing the feeding of selected monogastric animals.

## Animal science pharmacology 411 (VKF 411)

**Module credits** 12.00

**Prerequisites** DFS 320 and VGE 301

**Contact time** 3 lectures per week

**Language of tuition** Double Medium

**Academic organisation** Animal and Wildlife Sciences

**Period of presentation** Semester 1

### Module content

The pharmacology, laws, control and use of substances for animal production.

## Meat and dairy science 420 (VSX 420)

**Module credits** 10.00



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<b>Prerequisites</b>	DFS 320
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	English
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 2

#### **Module content**

Meat industry. Meat species. Composition of carcass and meat, slaughtering process, meat quality, and the consumer. Dairy industry. Composition and nutritional value of milk and factors that influence it. Milk production, milk quality and distribution.

### **Environmental resource assessment and management 450 (WDE 450)**

<b>Module credits</b>	20.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	fortnightly practicals, 3 lectures per week
<b>Language of tuition</b>	Both Afr and Eng
<b>Academic organisation</b>	Plant Production and Soil Sc
<b>Period of presentation</b>	Semester 1

#### **Module content**

Determining the resource potential of land on the basis of botanical composition, vegetation cover, animal grazing and browsing potential, water quality, soil quality, chemical, physical and biological soil degradation, soil erosion and other important environmental processes etc. which are essential for integrated agricultural land use practices. Evaluation of grasses and other vegetation types in terms of environmental adaptation, acceptability and adaptability to a sustainable utilization system and the management requirements of an integrated and adaptive management system.

### **Wildlife science 420 (WKE 420)**

<b>Module credits</b>	10.00
<b>Prerequisites</b>	VGE 301 or TDH
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Double Medium
<b>Academic organisation</b>	Animal and Wildlife Sciences
<b>Period of presentation</b>	Semester 2

#### **Module content**

Introductory aspects of wildlife conservation, habitat management, wildlife nutrition and keeping wildlife in zoological gardens.

### **Research methodology 400 (VKU 400)**

<b>Module credits</b>	12.00
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<b>Prerequisites</b>	Simultaneously register GVK 420, TLR 411
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<b>Contact time</b>	2 lectures per week, 1 seminar per week
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<b>Language of tuition</b>	English
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<b>Academic organisation</b>	Animal and Wildlife Sciences
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<b>Period of presentation</b>	Year
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### **Module content**

Research methodology in animal science: Literature studies and seminars. Introduction to the problem, approach to problem solving, methodology and appropriate reporting. Practice.

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The information published here is subject to change and may be amended after the publication of this information. The [General Regulations \(G Regulations\)](#) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the [General Rules](#) section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.