



University of Pretoria Yearbook 2016

BSc Food Science (03134011)

Duration of study 3 years

Total credits 428

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). A student must pass all the minimum prescribed and elective module credits as set out at the end of each year within a programme as well as the total required credits to comply with the particular degree programme. Please refer to the curricula of the respective programmes. At least 144 credits must be obtained at 300-/400-level, or otherwise as indicated by curriculum. The minimum module credits needed to comply with degree requirements is set out at the end of each study programme. Subject to the programmes as indicated a maximum of 150 credits will be recognised at 100-level. A student may, in consultation with the Head of Department and subject to the permission by the Dean, select or replace prescribed module credits not indicated in BSc three-year study programmes to the equivalent of a maximum of 36 module credits.

It is important that the total number of prescribed module credits is completed during the course of the study programme. The Dean may, on the recommendation of the Head of Department, approve deviations in this

regard. Subject to the programmes as indicated in the respective curricula, a student may not register for more than 75 module credits per semester at first-year level subject to permission by the Dean. A student may be permitted to register for up to 80 module credits in the first semester during the first year provided that he or she obtained a final mark of no less than 70% for grade 12 Mathematics and achieved an APS of 34 or more in the NSC.

Students who are already in possession of a bachelor's degree, will not receive credit for modules of which the content overlap with modules from the degree that was already conferred. Credits will not be considered for more than half the credits passed previously for an uncompleted degree. No credits at the final-year or 300- and 400-level will be granted.

The Dean may, on the recommendation of the programme manager, approve deviations with regard to the composition of the study programme.

Please note: Where elective modules are not specified, these may be chosen from any modules appearing in the list of modules.

It remains the student's responsibility to ascertain, prior to registration, whether they comply with the prerequisites of the modules they want to register for.

The prerequisites are listed in the Alphabetical list of modules.

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.

General promotion requirements in the faculty

All students whose academic progress is not acceptable can be suspended from further studies.

- A student who is excluded from further studies in terms of the stipulations of the abovementioned regulations, will be notified in writing by the Dean or Admissions Committee at the end of the relevant semester.
- A student who has been excluded from further studies may apply in writing to the Admissions Committee of the Faculty of Natural and Agricultural Sciences for re-admission.
- Should the student be re-admitted by the Admissions Committee, strict conditions will be set which the student must comply with in order to proceed with his/her studies.
- Should the student not be re-admitted to further studies by the Admissions Committee, he/she will be informed in writing.
- Students who are not re-admitted by the Admissions Committee have the right to appeal to the Senior Appeals Committee.
- Any decision taken by the Senior Appeals Committee is final.



Pass with distinction

A student obtains his or her degree with distinction if all prescribed modules at 300-level (or higher) are passed in one academic year with a weighted average of at least 75%, and obtain at least a subminimum of 65% in each of the relevant modules.



Curriculum: Year 1

Minimum credits: 140

Fundamental modules

Academic information management 111 (AIM 111)

Module content:

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

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

Academic information management 121 (AIM 121)

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.

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

Language and study skills 110 (LST 110)

Module content:

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

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

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 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.

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

Core modules

Biometry 120 (BME 120)

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.

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

Plant biology 161 (BOT 161)

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.

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

General chemistry 117 (CMY 117)

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.

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

General chemistry 127 (CMY 127)

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.



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

Introductory genetics 161 (GTS 161)

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.

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

Introduction to microbiology 161 (MBY 161)

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.

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

Molecular and cell biology 111 (MLB 111)

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.

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

Physics for biology students 131 (PHY 131)

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.

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

Mathematics 134 (WTW 134)

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.

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

Animal diversity 161 (ZEN 161)

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.

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





Curriculum: Year 2

Minimum credits: 144

Core modules

Introduction to proteins and enzymes 251 (BCM 251)

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.

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

Carbohydrate metabolism 252 (BCM 252)

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.

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



Lipid and nitrogen metabolism 261 (BCM 261)

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

Module credits	12.00
Service modules	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 2

Biochemical principles of nutrition and toxicology 262 (BCM 262)

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.

Module credits	12.00
Service modules	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 2

Introduction to food science and technology 250 (FST 250)

Module content:

Lectures: Food Science as a discipline. Activities of Food Scientists and Nutritionists. How food is produced, processed and distributed (food pipeline). World food problem. Human nutrition and human food requirements. Constituents of foods: Functional properties. Food quality. Food deterioration and control (food preservation). Unit operations in food processing. Food safety, risks and hazards. Principles of food packaging. Food legislation and labelling. Food processing and the environment. Practicals: Group assignments applying the theory in practice; practical demonstrations in pilot plants; guest lecturers on the world of food scientists and nutritionists; factory visit/videos of food processing.

Module credits 12.00

Prerequisites CMY 117 and CMY 127 and PHY 131 and WTW 134 or WTW 165 or TDH

Contact time 1 practical per week, 2 lectures per week

Language of tuition English

Academic organisation Food Science

Period of presentation Semester 1

Principles of food processing and preservation 260 (FST 260)

Module content:

Lectures: Food preservation technologies: concept of hurdle technology; heat (blanching, pasteurisation and sterilisation); cold (refrigeration and freezing); concentration and dehydration; food irradiation; fermentation; preservatives; new methods of food preservation. Effect of various food preservation technologies on the microbiological (shelf-life and safety issues), sensory and nutritional quality of foods. Practicals: Practical applications of above processes. Physical, chemical and sensory evaluation of processed foods. Assignment: Application of hurdle technology concept to a specific food product.

Module credits 12.00

Prerequisites CMY 117, CMY 127, MBY 161, PHY 131 and WTW 134 or WTW 165 or TDH

Contact time 2 lectures per week, 1 practical per week

Language of tuition English

Academic organisation Food Science

Period of presentation Semester 1 and Semester 2

Molecular genetics 251 (GTS 251)

Module content:

Chemical nature of DNA. Replication transcription, RNA processing and translation. Control of gene expression in prokaryotes and eukaryotes. Recombinant DNA technology and its applications in gene analysis and



manipulation.

Module credits	12.00
Service modules	Faculty of Engineering, Built Environment and Information Technology Faculty of Education
Prerequisites	GTS 161 GS
Contact time	fortnightly practicals, 2 lectures per week
Language of tuition	English
Academic organisation	Genetics
Period of presentation	Semester 1

Genetic diversity and evolution 261 (GTS 261)

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.

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

Bacteriology 251 (MBY 251)

Module content:

Growth, replication and survival of bacteria, Energy sources, harvesting from light versus oxidation, regulation of catabolic pathways, chemotaxis. Nitrogen metabolism, iron-scavenging. Alternative electron acceptors: denitrification, sulphate reduction, methanogenesis. Bacterial evolution, systematic and genomics. Biodiversity; bacteria occurring in the natural environment (soil, water and air), associated with humans, animals, plants, and those of importance in foods and in the water industry.

Module credits	12.00
Service modules	Faculty of Engineering, Built Environment and Information Technology
Prerequisites	MBY 161 GS
Contact time	2 lectures per week, 1 practical per week



Language of tuition	English
Academic organisation	Microbiology and Plant Path
Period of presentation	Semester 1

Mycology 261 (MBY 261)

Module content:

Organisation and molecular architecture of fungal thalli, chemistry of the fungal cell. Chemical and physiological requirements for growth and nutrient acquisition. Mating and meiosis; spore development; spore dormancy, dispersal and germination. Fungi as saprobes in soil, air, plant, aquatic and marine ecosystems; role of fungi as decomposers and in the deterioration of materials; fungi as predators and parasites; mycoses, mycetisms and mycotoxicoses; fungi as symbionts of plants, insects and animals. Applications of fungi in biotechnology.

Module credits	12.00
Service modules	Faculty of Engineering, Built Environment and Information Technology
Prerequisites	MBY 161
Contact time	1 practical per week, 2 lectures per week
Language of tuition	English
Academic organisation	Microbiology and Plant Path
Period of presentation	Semester 2

Nutrition 250 (VDG 250)

Module content:

Nutrition in the context of growth, development and composition of organisms. Metabolic processes and control in the body. Overview of nutritional processes. The study of the fundamental principles of nutrient metabolism (including macro- and micro-nutrients and water) and digestion physiology. Applications are made regarding man and animals.

Practical work: Experimental work and problem orientated tasks.

Module credits	12.00
Prerequisites	Natural and Agricultural Sciences students: CMY 127; Health Sciences students: second year status
Contact time	fortnightly practicals, 3 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 1

Food microbiology 262 (MBY 262)

Module content:



Primary sources of microorganisms in food. Factors affecting the growth and survival of microorganisms in food. Microbial quality, spoilage and safety of food. Different organisms involved, their isolation, screening and detection. Conventional approaches, alternative methods rapid methods. Food fermentations: fermentation types, principles and organisms involved.

Module credits	12.00
Prerequisites	MBY 251
Contact time	2 lectures per week, 1 practical per week
Language of tuition	English
Academic organisation	Microbiology and Plant Path
Period of presentation	Semester 2



Curriculum: Final year

Minimum credits: 144

Core modules

Integrated food science 350 (FST 350)

Module content:

Literature studies and seminar presentations on topics in food science, nutrition and health.

Module credits	18.00
Prerequisites	Second-year status, FST 250 and FST 260 or TDH
Contact time	2 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 2

Food chemistry 351 (FST 351)

Module content:

Lectures - Chemistry of major food components: Carbohydrates. Proteins. Lipids. Water. Chemical and nutritional aspects of food processing: implications of different processing techniques on the major food components. Functional properties of the major food components. Modification of functional properties of the major food components. Food analysis methodology. Practical work: Food analysis.

Module credits	18.00
Prerequisites	BCM 251 and BCM 252 and BCM 261 and BCM 262 or TDH
Contact time	1 practical per week, 2 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 1

Food chemistry (2) 352 (FST 352)

Module content:

Lectures - Basic food analysis and chemistry of the minor food components: Basic food analysis, vitamins, minerals, additives, contaminants. Chemical and nutritional aspects of food processing: implications of different processing techniques on minor food components. Functional properties of the minor food components. Food analysis methodology. Practical work: Food analysis.

Module credits	18.00
Prerequisites	BCM 251 and BCM 252 and BCM 261 and BCM 262 or TDH



Contact time	1 practical per week, 2 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 1

Food engineering 353 (FST 353)

Module content:

Lectures: Mass and energy balance. Heat transfer theory: Convection, conduction and radiation. Energy for food processing. Fluid flow and rheology. Unit operations: materials handling, cleaning, sorting, grading, peeling, disintegration, separation (e.g. membrane technology), pumping, mixing and forming, heating, concentration, drying, extrusion, refrigeration, freezing. Tutorials/practicals: Calculations on mass and energy balances, psychrometry, refrigeration and freezing.

Module credits	18.00
Prerequisites	FST 260 or TDH
Contact time	1 practical per week, 3 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 1

Principles of the science and technology of plant food 360 (FST 360)

Module content:

Cereal and legume grains, oilseeds and fruits and vegetables: Composition and structure. Quality assessment and grading. Post-harvest storage and physiology. Cleaning and sorting principles and technologies. Milling – principles and technologies, and their effects on product functionality and nutrient composition. Juice and oil extraction – principles and technologies, and their effects on product functionality and nutrient composition. Bread and baked goods making – principles and technologies, and their effects on product functionality and nutrient composition. Practical work: Laboratory analyses of components and products of cereals, oilseeds, legumes and fruits and vegetables; Determination of quality; Factory visits.

Module credits	18.00
Prerequisites	FST 250, FST 260, FST 351 and FST 352 or TDH
Contact time	2 lectures per week, 1 practical per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 2



Animal food science 361 (FST 361)

Module content:

Dairy science: Composition of milk; some physical properties of milk; factors affecting composition of milk; microbiological aspects of milk production; lactation; mechanical milking; milk defects; nutritive value of milk and milk products. Practical work: Chemical and microbiological tests of milk. Demonstration of the cheese-making process. Meat, poultry, fish and egg science: The composition, nutritional value and quality of meat, poultry, fish and eggs; factors affecting quality from slaughter or harvesting to consumption. Practical work: Visits to red meat and poultry abattoirs; quality determinations, egg quality and protein functionality.

Module credits	18.00
Prerequisites	FST 250, FST 260, FST 351 and FST 352 or TDH
Contact time	1 practical per week, 2 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 2

Food composition and applied nutritional programmes 364 (VWV 364)

Module content:

Generation, interpretation and application of food composition data in nutrition programmes. Chemical composition of foods: sampling for food analysis, assessing methods of food analysis for inclusion in food composition data. Interpretation of food composition data. Nutritional labeling of food. Use of nutritional data in food formulations. Dietary supplementation, enrichment and fortification of foods.

Module credits	18.00
Prerequisites	FST 351 and FST 352 or TDH
Contact time	2 lectures per week, 1 practical per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 2

Advanced animal and plant foods microbiology 362 (FST 362)

Module content:

With an integrated focus on animal and plant food commodities, this module considers food properties and processing operations that impact on the growth, survival and biochemical activity of microorganisms as they relate to spoilage, safety and fermentation. Temperature effects on microbial growth and survival including thermal destruction and cell and spore injury. Microbial stress response (adaptation) during processing. Selection for stress resistant and more virulent pathogenic variants and virulence mechanisms (toxin structure/function) of food-borne pathogens during food processing. Theory and practice of new advances in microbial detection and



identification methods. Tools for the production of safe foods including food safety objectives (FSOs) and risk analysis. Practicals will include advanced microbial detection and identification methods applied to animal and plant foods as well as the food supply chain.

Module credits	18.00
Prerequisites	FST 260, MBY 251, MBY 261, MBY 262
Contact time	180 minute practical per week, 2 lectures per week
Language of tuition	English
Academic organisation	Food Science
Period of presentation	Semester 1

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 each student to familiarise himself or herself 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.