

# University of Pretoria Yearbook 2024

## BSc extended programme - Biological and Agricultural Sciences (02130014)

**Department** Natural and Agricultural Sciences Dean's Office

**Minimum duration of study** 4 years

**Total credits** 152

**NQF level** 07

### Admission requirements

#### Important information for all prospective students for 2024

The admission requirements below apply to all who apply for admission to the University of Pretoria with a **National Senior Certificate (NSC) and Independent Examination Board (IEB) qualifications**. [Click here for this Faculty Brochure](#).

Candidates who do not comply with the minimum admission requirements of programmes in the Departments of Biological and Agricultural Sciences, may be considered for admission to the BSc – Extended programme for the Biological and Agricultural Sciences, which requires an additional year of study.

Please note: Students who are placed in the BSc – Extended programme will take a minimum of five years to complete the BScAgric, BSc (Culinary Science) or BSc (Nutrition) programmes.

#### BSc - Extended Programme - Biological and Agricultural Sciences

##### Minimum requirements

##### Achievement level

##### English Home

##### Language or

##### English First

##### Additional

##### Language

NSC/IEB

4

**Mathematics**

NSC/IEB

4

**Physical Sciences**

NSC/IEB

4

**APS**

**26**

\*Students enrolled for the BSc – Extended programme – Biological and Agricultural Sciences, do not qualify to apply for the mid-year intake in the Faculty of Health Sciences.

#### Note:

\*Students who meet all the requirements for the corresponding mainstream programmes will not be admitted to the BSc – Extended programmes.

\*Please note that only students who apply in their final NSC or equivalent qualification year will be considered for admission into any of the BSc – Extended programmes. Students who are upgrading or taking a gap year will not be considered.

Life Orientation is excluded when calculating the APS.

Applicants currently in Grade 12 must apply with their final Grade 11 (or equivalent) results.

Applicants who have completed Grade 12 must apply with their final NSC or equivalent qualification results.

Please note that meeting the minimum academic requirements does not guarantee admission.

Successful candidates will be notified once admitted or conditionally admitted.

Applicants should check their application status regularly on the UP Student Portal at [click here](#).

**Applicants with qualifications other than the abovementioned** should refer to the Brochure:

Undergraduate Programme Information 2024: Qualifications other than the NSC and IEB, available at [click here](#).

**International students:** [Click here](#).

## Additional requirements

- a. Students who are admitted to one of the BSc extended programmes register for one specific programme. Three extended programmes are available:
  - BSc extended programme – Mathematical Sciences
  - BSc extended programme – Biological and Agricultural Sciences
  - BSc extended programme – Physical Sciences
- b. These programmes are followed by students who, as a result of exceptional circumstances, will benefit from an extended programme.
- c. Students who do not comply with the normal three-year BSc entrance requirements for study in the Faculty of Natural and Agricultural Sciences, may nevertheless be admitted to the Faculty by being placed on the BSc extended programme. Generally the BSc extended programme means that the first study year in Mathematics, Physics, Biology and Chemistry is extended to take two years. After completing the BSc extended programme successfully, students join the second year of the normal BSc programme to complete their degrees. The possibility of switching over to other faculties such as Engineering, Built Environment and Information Technology, Veterinary Science and Health Sciences, after one or two years in the extended programme, exists. This depends on selection rules and other conditions stipulated by the other faculties.
- d. Students who wish to follow one of the BSc extended programmes will be subjected to an Institutional Proficiency Test and will be considered for admission by the Admissions Committee. Information in this regard is available at the Client Services Centre.
- e. Applications for admission to the BSc extended programme should be submitted before 30 September each year. Details are obtainable from the Student Administration at the Faculty of Natural and Agricultural Sciences.
- f. The rules and regulations applicable to the normal study programmes apply mutatis mutandis to the BSc extended programme, with exceptions as indicated in the regulations pertaining to the BSc extended programme. For instance, students placed in the BSc extended programme must have a National Senior Certificate with admission for degree purposes.
- g. An admissions committee considers applications for the BSc extended programme annually. Regarding subject choices, admitted students are individually placed on the BSc extended programme according to their prospective field of study. Students may NOT change this placement without the permission of the Chairperson of the admissions committee.

## Other programme-specific information

- The BSc extended programmes are not available for students who meet all the requirements for the corresponding mainstream programme.
- Please note that only students who apply in their final NSC or equivalent qualification year will be considered for admission into any of the BSc extended programmes.
- Students who are placed on the BSc extended programme will take a minimum of five years to complete the BScAgric, BSc (Culinary Science) or BSc (Nutrition) programmes.
- Students enrolled for the BSc extended programme – Biological and Agricultural Sciences, do not qualify to apply for the mid-year intake in the Faculty of Health Sciences.
- Progression from the BSc extended programme – Mathematical Sciences 02130016 to the mathematics-intensive programmes will be considered only if students obtained a GPA of 65% in their first-year modules. Students who pass all first-year modules will be advised on alternative academic pathways. In addition, admission into the BSc (Actuarial and Financial Mathematics) programme will only be considered if students have passed IAS 111 and achieved a minimum mark of 60% in WTW 153 and WST 153.

### 1.1 Requirements for specific modules

A candidate who:

- does not qualify for STK 110, must enrol for STK 113 and STK 123;
- registers for Mathematical Statistics (WST) and Statistics (STK) modules must take note that WST and STK modules, except for STK 281, may not be taken simultaneously in a programme; a student must take one and only one of the following options:
  - WST 111, WST 121, WST 212, WST 211, WST 221, WST 311, WST 312, WST 322, WST 321, and STK 353  
or
  - WST 111, WST 121, WST 212, WST 211, WST 221, WST 311, WST 312, WST 322, STK 320, STK 353.  
or
  - STK 110, STK 122, STK 210, STK 220, WST 212, STK 310, STK 320, STK 353.
- registers for a module presented by another faculty must take note of the timetable clashes, prerequisites for that module, subminimum required in examination papers, supplementary examinations, etc.

### 1.2 Fundamental modules

- It is compulsory for all new first-year students to satisfactorily complete the Academic orientation (UPO 102) and to take Academic information management modules (AIM 111 and AIM 121) and Language and study skills (LST 110). Please see curricula for details.
- Students who intend to apply for admission to MBChB or BChD in the second semester, when places become available in those programmes, may be permitted to register for up to 80 module credits and 4 core modules in the first semester during the first year provided that they obtained a final mark of no less than 70% for Grade 12 Mathematics and achieved an APS of 34 or more in the NSC.

## Promotion to next study year

### Academic promotion requirements

It is expected of students who register for the first year of the BSc extended programme to pass all the prescribed modules of the first year.

It is expected of students accepted into the BSc extended programme to finish a complete corresponding BSc first year within the two years of enrolment in the BSc extended programme. Students who do not show progress during the first semester of the first year will be referred to the Admissions Committee of the Faculty.

## Curriculum: Year 1

**Minimum credits: 88**

Fundamental = 24

Core = 64

**NB Students may register for an extended programme module only once.**

### Fundamental modules

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

<b>Module credits</b>	4.00
<b>NQF Level</b>	05
<b>Service modules</b>	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 and Religion
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Information Science
<b>Period of presentation</b>	Semester 1

#### Module content

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

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

<b>Module credits</b>	4.00
<b>NQF Level</b>	05
<b>Service modules</b>	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 and Religion Faculty of Veterinary Science
<b>Prerequisites</b>	No prerequisites.

**Contact time** 2 lectures per week

**Language of tuition** Module is presented in English

**Department** Informatics

**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, life and study skills 133 (LST 133)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** Admission into BSc Four-year programme and BCom Four-year programme

**Contact time** 4 discussion classes per week, Foundation Course

**Language of tuition** Module is presented in English

**Department** Unit for Academic Literacy

**Period of presentation** Semester 1

#### Module content

In this module students use different information and time management strategies, build academic vocabulary, revise basic grammar concepts and dictionary skills, examine learning styles, memory and note-taking techniques, practise academic reading skills and explore basic research and referencing techniques, learn how to use discourse markers and construct definitions, and are introduced to paragraph writing. The work is set in the context of the students' field of study.

### Language, life and study skills 143 (LST 143)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** LST 133

**Contact time** 4 discussion classes per week, Foundation Course

**Language of tuition** Module is presented in English

**Department** Unit for Academic Literacy

**Period of presentation** Semester 2

## Module content

In this module students learn how to interpret and use visual literacy conventions. Students write more advance paragraphs, and also learn how to structure academic writing, how to refine their use of discourse markers and referencing techniques and how to structure their own academic arguments. Students' writing is expected to be rational, clear and concise. As a final assignment all aspects of the LST 133 and LST 143 modules are combined in a research assignment. In this project, students work in writing teams to produce a chapter on a career and to present an oral presentation of aspects of the chapter. The work is set in the context of the students' field of study.

## Academic orientation 120 (UPO 120)

<b>Module credits</b>	0.00
<b>NQF Level</b>	00
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Humanities Deans Office
<b>Period of presentation</b>	Year

## Core modules

### Chemistry 133 (CMY 133)

<b>Module credits</b>	8.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education
<b>Prerequisites</b>	Admission to the relevant programme.
<b>Contact time</b>	2 lectures per week, 3 discussion classes per week, Foundation Course, fortnightly practicals
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Chemistry
<b>Period of presentation</b>	Semester 1

## Module content

Bonding and molecular geometry: VSEPR theory; bonding and organic compounds (structural formulas, classification and nomenclature); matter and its properties; mole concept; reaction stoichiometry; reactions in aqueous solutions: precipitation, acid base and redox. Practical laboratory exercises and assignments are based on the themes covered in the module theory component. The UN sustainable development goals #6, 7 & 12 are addressed in a practical on industrial pollution.

### Chemistry 143 (CMY 143)

<b>Module credits</b>	8.00
<b>NQF Level</b>	05



<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education
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<b>Prerequisites</b>	CMY 133
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<b>Contact time</b>	2 lectures per week, 3 discussion classes per week, Foundation Course, fortnightly practicals
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<b>Language of tuition</b>	Module is presented in English
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<b>Department</b>	Chemistry
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<b>Period of presentation</b>	Semester 2
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### Module content

Bonding and molecular geometry: VSEPR theory; bonding and organic compounds (structural formulas, classification and nomenclature); matter and its properties; mole concept; reaction stoichiometry; reactions in aqueous solutions: precipitation, acid base and redox.

## Molecular and cell biology 133 (MLB 133)

<b>Module credits</b>	8.00
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<b>NQF Level</b>	05
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<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Health Sciences Faculty of Veterinary Science
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<b>Prerequisites</b>	Admission to the relevant programme.
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<b>Contact time</b>	2 lectures per week, Fortnightly discussions, Fortnightly practicals, Foundation Course
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<b>Language of tuition</b>	Module is presented in English
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<b>Department</b>	Department of Plant and Soil Sciences
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<b>Period of presentation</b>	Semester 1
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### Module content

Introduction to life science and life on earth, including the importance and relevance of the Sustainable Development Goals; the scientific method, principles of microscopy, introduction to the molecular structure and function of the cell. Basic chemistry of the cell. Structure and composition of prokaryotic and eukaryotic cells.

## Molecular and cell biology 143 (MLB 143)

<b>Module credits</b>	8.00
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<b>NQF Level</b>	05
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<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Health Sciences Faculty of Veterinary Science
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<b>Prerequisites</b>	Admission to the relevant programme.
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**Contact time** 2 lectures per week, Fortnightly discussions, Fortnightly practicals, Foundation Course

**Language of tuition** Module is presented in English

**Department** Department of Plant and Soil Sciences

**Period of presentation** Semester 2

**Module content**

Ultrastructure and function of cellular organelles, membranes and the cytoskeleton. General principles of energy, enzymes and cell metabolism including selected cellular processes, e.g. respiration and photosynthesis.

### Physics 133 (PHY 133)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** Admission to the relevant programme.

**Contact time** 2 discussion classes per week, 2 lectures per week, 2 practicals per week, Foundation Course

**Language of tuition** Module is presented in English

**Department** Physics

**Period of presentation** Semester 1

**Module content**

Heat: temperature and scales, work, energy and heat, calorimetry, specific heat, expansion, heat transfer. Measurements: SI-units, measuring error and uncertainty, (graphs), significant figures, mathematical modelling. One-dimensional kinematics. Geometrical optics: reflection, refraction, dispersion, mirrors, thin lenses.

### Physics 144 (PHY 144)

**Module credits** 8.00

**NQF Level** 05

**Service modules** Faculty of Education

**Prerequisites** PHY 133

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

**Language of tuition** Module is presented in English

**Department** Physics

**Period of presentation** Semester 2

## Module content

The main topics covered in this module are Mechanics and Thermodynamics. Kinematics: Basic types of motion, one-dimensional motion, two- and three dimensional motion, linear momentum and its conservation, multi-object systems and the centre of mass.

Forces: Types of forces, Newton's Laws of Mechanics and applications, friction.

Energy: Work, heat, conservation of mechanical energy.

Thermodynamics: First law of thermodynamics, empirical gas laws, mechanical model of the ideal gas, energy of the ideal gas, basic thermodynamic processes.

## Precalculus 133 (WTW 133)

**Module credits** 8.00

**NQF Level** 05

**Service modules** Faculty of Education  
Faculty of Economic and Management Sciences

**Prerequisites** BCom Ext prgm students who wish to transfer to BCom Economics or BCom Investment Mgmt: 50% for Mathematics in Gr 12. BEd programmes: 50% for Mathematics Gr 12. BSc Ext prgm - Biological and Agricultural Sciences: 50% for Mathematics in Gr 12.

**Contact time** 1 practical per week, 1 tutorial per week, 3 lectures per week, Foundation Course

**Language of tuition** Module is presented in English

**Department** Mathematics and Applied Mathematics

**Period of presentation** Semester 1

## Module content

Real numbers, elementary set notation, exponents and radicals. Algebraic expressions, fractional expressions, linear and quadratic equations, inequalities. Coordinate geometry: lines, circles. Functions: definition, notation, piecewise defined functions, domain and range, graphs, transformations of functions, symmetry, even and odd functions, combining functions, one-to-one functions and inverses, polynomial functions and zeros.

Sequences, summation notation, arithmetic, geometric sequences, infinite geometric series, annuities and instalments. Degrees and radians, unit circle, trigonometric functions, fundamental identities, trigonometric graphs, trigonometric identities, double-angle, half-angle formulae, trigonometric equations, applications.

This module is offered at the Mamelodi Campus to students from the BSc and BCom Extended programmes. At the Groenkloof Campus it is offered to BEd students.

## Mathematics 144 (WTW 144)

**Module credits** 8.00

**NQF Level** 05

**Prerequisites** WTW 133 or WTW 135 GS. BCom Extended Programme students who wish to transfer to BCom (Economics):

**Contact time** 1 tutorial per week, 3 lectures per week, Foundation Course

**Language of tuition** Module is presented in English

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<b>Department</b>	Mathematics and Applied Mathematics
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<b>Period of presentation</b>	Semester 2
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**Module content**

Functions: Rate of change, exponential functions, the natural logarithm, exponential growth and decay, proportionality, power functions, fitting formulas to data. Rates of change and the derivative: Instantaneous rate of change, the derivative function, interpretations of the derivative, the second derivative.

Differentiation: Formulas and rules, applications, extremes of a function. All topics are studied in the context of applications.

## Curriculum: Year 2

### Minimum credits: 32

Core = 32

Elective = According to BSc programme of choice

### Additional information:

Students must register for the applicable third-semester modules(second year, first semester) and the second-semester, modules must be selected from the normal BSc programme of the student's choice.

### Equivalent modules:

- Chemistry extended modules: CMY 133, CMY 143 and CMY 154: Equivalent to BSc module CMY 117
- Molecular and cell biology extended modules: MLB 133, MLB 143 and MLB 153: Equivalent to BSc module MLB 111
- Physics extended modules: PHY 133, PHY 144 and PHY 154: Equivalent to BSc module PHY 131
- Mathematics extended modules: WTW 133, WTW 143 and WTW 154: Equivalent to BSc module WTW 134

**Please note:** If FRK is selected as an elective, INF 183 has to be taken as well.

## Core modules

### Biometry 120 (BME 120)

<b>Module credits</b>	16.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Natural and Agricultural Sciences Faculty of Veterinary Science
<b>Prerequisites</b>	At least 4 (50-59%) in Mathematics in the Grade 12 examination, or at least 50% in both Statistics 113, 123
<b>Contact time</b>	1 practical per week, 4 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Statistics
<b>Period of presentation</b>	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.



## Plants and society 161 (BOT 161)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** MLB 111 GS

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

**Language of tuition** Module is presented in English

**Department** Department of Plant and Soil Sciences

**Period of presentation** Semester 2

### Module content

Botanical principles of structure and function; diversity of plants; introductory plant systematics and evolution; role of plants in agriculture and food security; principles and applications of plant biotechnology; economical and valuable medicinal products derived from plants; basic principles of plant ecology and their application in conservation and biodiversity management.

This content aligns with the United Nation's Sustainable Development Goals of No Poverty, Good Health and Well-being, Climate Action, Responsible Consumption and Production, and Life on Land.

## General chemistry 127 (CMY 127)

**Module credits** 16.00

**NQF Level** 05

**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** Module is presented in English

**Department** Chemistry

**Period of presentation** Semester 2

### Module content

Theory: General physical-analytical chemistry: Chemical equilibrium, acids and bases, buffers, solubility equilibrium, 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 aminoacids. Practical: Molecular structure (model building), synthesis and properties of simple organic compounds.



## Chemistry 154 (CMY 154)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** CMY 133 and CMY 143

**Contact time** 2 tutorials per week, 3 lectures per week, Foundation Course, fortnightly practicals

**Language of tuition** Module is presented in English

**Department** Chemistry

**Period of presentation** Semester 1

### Module content

Principles of reactivity: energy and chemical reactions. Physical behaviour of gasses, liquids, solids and solutions and the role of intermolecular forces. Rate of reactions: Introduction to Chemical kinetics. Introduction to chemical equilibrium. Introduction to organic chemistry: hybridisation, isomers (structural, geometrical and conformational), additions reactions and reaction mechanisms.

## Introductory genetics 161 (GTS 161)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** MLB 111 GS

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

**Language of tuition** Module is presented in English

**Department** Biochemistry, Genetics and Microbiology

**Period of presentation** Semester 2

### Module content

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

## Introduction to microbiology 161 (MBY 161)

**Module credits** 8.00

**NQF Level** 05

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



<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 lectures per week, fortnightly tutorials
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Biochemistry, Genetics and Microbiology
<b>Period of presentation</b>	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 153 (MLB 153)

<b>Module credits</b>	8.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology
<b>Prerequisites</b>	MLB 143
<b>Contact time</b>	2 lectures per week, 2 practicals/tutorials per week, Foundation Course
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Biochemistry, Genetics and Microbiology
<b>Period of presentation</b>	Semester 1

#### Module content

Cell growth and cell division, Mendelian and human genetics, principles of molecular genetics, principles of recombinant DNA technology and its application.

### Physics 154 (PHY 154)

<b>Module credits</b>	8.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Education
<b>Prerequisites</b>	PHY 143
<b>Contact time</b>	1 practical per week, 4 lectures per week, Foundation Course
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Physics
<b>Period of presentation</b>	Semester 1

## Module content

The main topic in this module is Electricity, Sound, Optics, and Modern Physics.

Static Electricity: Electric charge and force, electric field, the electric energy, electric potential, conservation of electrical energy.

Flow of charge: Capacitors, application of charge flow to nerves.

Sound: Vibrations, waves in unconfined and confined media, applications to human hearing.

Optics: Reflection, refraction, applications to optometry and ophthalmology.

Atomic physics: Atomic models, x-rays.

Nuclear physics: The stable atomic nucleus, radioactivity, nuclear spin and applications to medical diagnostics.

## Mathematics 154 (WTW 154)

**Module credits** 8.00

**NQF Level** 05

**Prerequisites** WTW 144

**Contact time** 1 tutorial per week, 3 lectures per week, Foundation Course

**Language of tuition** Module is presented in English

**Department** Mathematics and Applied Mathematics

**Period of presentation** Semester 1

## Module content

Integration: Accumulated change, the definite integral, anti-derivatives, the definite integral as an area, interpretations of the definite integral.

Matrices and systems of linear equations: Matrix addition and scalar multiplication, matrix multiplication, systems of linear equations. All topics are studied in the context of applications.

## Animal diversity 161 (ZEN 161)

**Module credits** 8.00

**NQF Level** 05

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

**Prerequisites** No prerequisites.

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

**Language of tuition** Module is presented in English

**Department** Zoology and Entomology

**Period of presentation** Semester 2



## Module content

Animal classification, phylogeny organisation 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 in various animal phyla. In-class discussion will address the sustainable development goals #3, 12, 13, 14 and 15 (Good Health and Well-being. Responsible Consumption and Production, Climate Action, Life Below Water, Life on Land).

## Elective modules

### Introduction: Human anatomy and embryology 121 (ANA 121)

<b>Module credits</b>	4.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	MLB 111 and CMY 117; Only for BSc Medical Sciences students.
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Anatomy
<b>Period of presentation</b>	Semester 2

## Module content

Terminology, musculo-skeletal system, nervous system, surface anatomy, cardiovascular system, respiratory system, urogenital system, gastro-intestinal system, endocrine system, introductory osteology and joints, introductory embryology.

### Human osteology 122 (ANA 122)

<b>Module credits</b>	4.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	CMY 117 and MLB 111; Only for BSc Medical Sciences students
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Anatomy
<b>Period of presentation</b>	Semester 2

## Module content

Introduction to osteology, bone function and classification, humerus, radius, ulna, femur, tibia, fibula, clavicle, scapula, ribs, sternum, vertebrae, pelvis, hand and foot bones, sesamoid bones, skull, mandible, joints.



## Basic human histology 126 (ANA 126)

<b>Module credits</b>	4.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	CMY 117 and MLB 111; Only for BSc Medical Sciences students.
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Anatomy
<b>Period of presentation</b>	Semester 2

### Module content

General introduction to cells and tissue, terminology, the cell and cytoplasm, organelles and inclusions, surface and glandular epithelium, general connective tissue, specialised connective tissue, namely cartilage, bone, blood and haemopoietic tissue, muscle and nervous tissue.

## Introduction to the philosophy of medicine 155 (FIL 155)

<b>Module credits</b>	6.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Health Sciences Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 lecture per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Philosophy
<b>Period of presentation</b>	Semester 1

### Module content

This module consists of two components: first, a philosophy of science component which provides an introduction to scientific reasoning and philosophical debates on scientific method; and secondly, a philosophy of medicine component which focuses on the relation between causation and the concept of disease and on the nature of evidence-based medicine.

## Financial accounting 111 (FRK 111)

<b>Module credits</b>	10.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Law Faculty of Natural and Agricultural Sciences



<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	4 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Accounting
<b>Period of presentation</b>	Semester 1

#### Module content

The nature and function of accounting; the development of accounting; financial position; financial result; the recording process; processing of accounting data; treatment of VAT; elementary income statement and balance sheet; flow of documents; accounting systems; introduction to internal control and internal control measures; bank reconciliations; control accounts; adjustments; financial statements of a sole proprietorship; the accounting framework.

### Financial accounting 121 (FRK 121)

<b>Module credits</b>	12.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	FRK 111 GS
<b>Contact time</b>	4 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Accounting
<b>Period of presentation</b>	Semester 2

#### Module content

Property, plant and equipment; intangible assets; inventories; liabilities; presentation of financial statements; enterprises without profit motive; partnerships; companies; close corporations; cash flow statements; analysis and interpretation of financial statements.

### Physiology 110 (FSG 110)

<b>Module credits</b>	6.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Humanities Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	3 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Physiology

**Period of presentation** Semester 1

### Module content

Introduction (terminology and anatomical orientation); chemical principles; cytology and histology; neuro-physiology and the senses; haematology and body fluids; cardiovascular system.

## Physiology 120 (FSG 120)

**Module credits** 6.00

**NQF Level** 05

**Service modules** Faculty of Humanities  
Faculty of Natural and Agricultural Sciences

**Prerequisites** FSG 110

**Contact time** 3 lectures per week

**Language of tuition** Module is presented in English

**Department** Physiology

**Period of presentation** Semester 2

### Module content

Respiratory system; nutrition; digestion and metabolism; kidneys and acid-base equilibrium; endocrinology; reproduction physiology and reproduction; skin and body temperatures.

## Informatics 183 (INF 183)

**Module credits** 3.00

**NQF Level** 05

**Prerequisites** No prerequisites.

**Contact time** 1 practical per week

**Language of tuition** Module is presented in English

**Department** Informatics

**Period of presentation** Year

### Module content

Computer processing of accounting information.

## Psychology 110 (SLK 110)

**Module credits** 12.00

**NQF Level** 05

**Service modules** Faculty of Engineering, Built Environment and Information Technology  
Faculty of Education  
Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences

<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 discussion classes per week, 2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Psychology
<b>Period of presentation</b>	Semester 1

#### Module content

This module is a general orientation to Psychology. An introduction is given to various theoretical approaches in Psychology, and the development of Psychology as a science is discussed. Selected themes from everyday life are explored and integrated with psychological principles. This module focuses on major personality theories. An introduction is given to various paradigmatic approaches in Psychology.

### Psychology 120 (SLK 120)

<b>Module credits</b>	12.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Engineering, Built Environment and Information Technology Faculty of Education Faculty of Health Sciences Faculty of Natural and Agricultural Sciences

<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 discussion classes per week, 2 lectures per week
<b>Language of tuition</b>	Module is presented in English
<b>Department</b>	Psychology
<b>Period of presentation</b>	Semester 2

#### Module content

This module introduces the student to a basic knowledge and understanding of the biological basis of human behaviour. The module addresses the key concepts and terminology related to the biological subsystem, the rules and principles guiding biological psychology, and identification of the interrelatedness of different biological systems and subsystems. In this module various cognitive processes are studied, including perception, memory, thinking, intelligence and creativity. Illustrations are given of various thinking processes, such as problem solving, critical, analytic and integrative thinking.

### Basic food preparation 121 (VDS 121)

<b>Module credits</b>	6.00
<b>NQF Level</b>	05
<b>Service modules</b>	Faculty of Health Sciences
<b>Prerequisites</b>	VDS 111
<b>Contact time</b>	1 lecture per week, 1 practical per week
<b>Language of tuition</b>	Module is presented in English

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**Department** Consumer and Food Sciences

**Period of presentation** Semester 2

**Module content**

Module 1: Principles and practices of food preparation and cooking techniques. Mise en place, weighing and measurement techniques, equipment and terminology as applied in food preparation. Basic food quality control.  
Module 2: Food preparation basics of the following: starches and cereals

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**General Academic Regulations and Student Rules**

The [General Academic Regulations \(G Regulations\)](#) and [General Student Rules](#) apply to all faculties and registered students of the University, as well as all prospective students who have accepted an offer of a place at the University of Pretoria. On registering for a programme, the student bears the responsibility of ensuring that they familiarise themselves with the General Academic Regulations applicable to their registration, as well as the relevant faculty-specific and programme-specific regulations and information as stipulated in the relevant yearbook. Ignorance concerning these regulations will not be accepted as an excuse for any transgression, or basis for an exception to any of the aforementioned regulations. The G Regulations are updated annually and may be amended after the publication of this information.

**Regulations, degree requirements and information**

The faculty regulations, information on and requirements for the degrees published here are subject to change and may be amended after the publication of this information.

**University of Pretoria Programme Qualification Mix (PQM) verification project**

The higher education sector has undergone an extensive alignment to the Higher Education Qualification Sub-Framework (HEQSF) across all institutions in South Africa. In order to comply with the HEQSF, all institutions are legally required to participate in a national initiative led by regulatory bodies such as the Department of Higher Education and Training (DHET), the Council on Higher Education (CHE), and the South African Qualifications Authority (SAQA). The University of Pretoria is presently engaged in an ongoing effort to align its qualifications and programmes with the HEQSF criteria. Current and prospective students should take note that changes to UP qualification and programme names, may occur as a result of the HEQSF initiative. Students are advised to contact their faculties if they have any questions.