BSc Medical Sciences (02133407)

Duration of study: 3 years
Total credits: 466

Admission requirements

- The following persons will be considered for admission: a candidate who is in possession of a certificate that is deemed by the University to be equivalent to the required Grade 12 certificate with university endorsement; a candidate who is a graduate from another tertiary institution or has been granted the status of a graduate of such an institution; and a candidate who is a graduate of another faculty at the University of Pretoria.
- 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.

<table>
<thead>
<tr>
<th>Achievement level</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science</th>
<th>APS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NSC/IEB</td>
<td>HIGCSE</td>
<td>AS-Level</td>
<td>A-Level</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>3</td>
<td>C</td>
<td>C</td>
</tr>
</tbody>
</table>

Candidates who do not comply with the minimum admission requirements for BSc (Medical Sciences), may be considered for admission to the BSc – Extended programme for the Biological and Agricultural Sciences. The BSc – Extended programme takes place over a period of four years instead of the normal three years.

BSc - Extended programme for the Biological and Agricultural Sciences:

<table>
<thead>
<tr>
<th>Achievement level</th>
<th>Afrikaans or English</th>
<th>Mathematics</th>
<th>Physical Science</th>
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<td></td>
<td>NSC/IEB</td>
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<td>A-Level</td>
</tr>
<tr>
<td>BSc - Extended programme for the Biological and Agricultural Sciences</td>
<td>4</td>
<td>3</td>
<td>D</td>
<td>D</td>
</tr>
</tbody>
</table>

Other programme-specific information

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: 142

Minimum credits:
Fundamental =  12
Core =  128

Additional information:
Students who do not qualify for AIM 102 must register for AIM 111 and AIM 121.

Please note: Students who have not passed all the first-year, first-semester modules in BScMedSci are excluded from continuing with BScMedSci in the second semester and need to deregister and reregister for another BSc programme, eg BSc in Biological Sciences (or a completely different degree programme).

Students intending to apply for the 65 MBChB, or the 5 BChD places that become available in the second semester, may only enrol for FIL 155(6), MGW 112(6) and MTL 180(12) with the understanding that:

• they obtained an APS of at least 34 and passed grade 12 Mathematics with at least 70%; and
• they may defer doing WTW 134 in the first semester, however, should they not be selected and want to continue with a BSc programme, WTW 165 must be taken in the second semester of the first year.

Please note: ANA modules can only be taken by BSc (Medical Science) students.

Fundamental modules

Academic information management 111 (AIM 111)

Module credits 4.00

<table>
<thead>
<tr>
<th>Service modules</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty of Engineering, Built Environment and Information Technology</td>
</tr>
<tr>
<td>Faculty of Education</td>
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<tr>
<td>Faculty of Economic and Management Sciences</td>
</tr>
<tr>
<td>Faculty of Humanities</td>
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<tr>
<td>Faculty of Law</td>
</tr>
<tr>
<td>Faculty of Health Sciences</td>
</tr>
<tr>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Faculty of Theology</td>
</tr>
</tbody>
</table>

Prerequisites No prerequisites.

Contact time MAMELODI, 2 lectures per week

Language of tuition Separate classes for Afrikaans and English

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)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>4.00</th>
</tr>
</thead>
</table>
| **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** | Separate classes for Afrikaans and English |
| **Academic organisation** | 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 and study skills 110 (LST 110)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>6.00</th>
</tr>
</thead>
</table>
| **Service modules** | Faculty of Natural and Agricultural Sciences  
Faculty of Veterinary Science |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 2 lectures per week |
| **Language of tuition** | Module is presented in 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)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>0.00</th>
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</thead>
<tbody>
<tr>
<td><strong>Language of tuition</strong></td>
<td>Afrikaans and English is used in one class</td>
</tr>
<tr>
<td><strong>Academic organisation</strong></td>
<td>Natural + Agric Sciences Dean</td>
</tr>
<tr>
<td><strong>Period of presentation</strong></td>
<td>Year</td>
</tr>
</tbody>
</table>
### Academic information management 102 (AIM 102)

<table>
<thead>
<tr>
<th><strong>Module credits</strong></th>
<th>6.00</th>
</tr>
</thead>
</table>

**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**
- Separate classes for Afrikaans and English

**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

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

<table>
<thead>
<tr>
<th><strong>Module credits</strong></th>
<th>4.00</th>
</tr>
</thead>
</table>

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

**Prerequisites**
- MLB 111 and CMY 117; Only for BSc Medical Sciences students.

**Contact time**
- 1 practical per week, 1 lecture per week

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

**Academic organisation**
- Anatomy

**Period of presentation**
- 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)

<table>
<thead>
<tr>
<th><strong>Module credits</strong></th>
<th>4.00</th>
</tr>
</thead>
</table>

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

**Prerequisites**
- Only for BSc Medical Sciences students.
**Contact time**
1 practical per week, 1 lecture per week

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

**Academic organisation**
Anatomy

**Period of presentation**
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.

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**Basic human histology 126 (ANA 126)**

**Module credits**
4.00

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

**Prerequisites**
CMY 117 and MLB 111; Only for BSc Medical Sciences students.

**Contact time**
1 practical per week, 1 lecture per week

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

**Academic organisation**
Anatomy

**Period of presentation**
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.

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**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**
Separate classes for Afrikaans and English

**Academic organisation**
Statistics

**Period of presentation**
Semester 2
Module content

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 Separate classes for Afrikaans and English

Academic organisation Chemistry

Period of presentation Semester 1

Module content

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 Separate classes for Afrikaans and English

Academic organisation 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.

**Science and world views 155 (FIL 155)**

<table>
<thead>
<tr>
<th>Module credits</th>
<th>6.00</th>
</tr>
</thead>
</table>
| **Service modules** | Faculty of Health Sciences  
Faculty of Natural and Agricultural Sciences |
| **Prerequisites** | No prerequisites. |
| **Contact time** | 1 lecture per week |
| **Language of tuition** | Module is presented in English |
| **Academic organisation** | Philosophy |
| **Period of presentation** | Semester 1 |

**Module content**  
This is a broad introduction to the philosophy and history of science. Examples of themes and historical periods which are covered include: world views in ancient Greece; Socrates; Plato – the founder of Western thought; Aristotle – the foundation of a new tradition; Leonardo da Vinci; the foundation of modern science; the wonder years of the seventeenth century – the flourishing of the sciences and philosophy; the rising of mechanization; a drastic turn in man's vision – the rise of psychology; how the theory of relativity changed our view of the cosmos; quantum theory and its implications for the modern world view; the biological sciences and the secrets of life; the rise and role of psychology; the neuro-sciences; the place, role and benefit of philosophical thought in the sciences.

**Introductory genetics 161 (GTS 161)**

<table>
<thead>
<tr>
<th>Module credits</th>
<th>8.00</th>
</tr>
</thead>
</table>
| **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** | Separate classes for Afrikaans and English |
| **Academic organisation** | Genetics |
| **Period of presentation** | Semester 2 |
Module content

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 Separate classes for Afrikaans and English
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 Separate classes for Afrikaans and English
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
Separate classes for Afrikaans and English

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
Separate classes for Afrikaans and English

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.
Curriculum: Year 2

Minimum credits: 144

Minimum credits:
Core = 96
Elective = 48

Additional information:

Elective credits:
FLG option: 48 credits, GTS option: 48 credits, FAR option: same as FLG option

ANA + FLG option: First semester FLG 211 (12) and FLG 212 (12) second semester FLG 221 (12) and FLG 222 (12)

ANA + GTS option: First semester GTS 251 (12) and MBY 251 (12), second semester GTS 261 (12) and MBY 261 (12)

ANA + FLG/FAR option only in Final year: Same as FLG option

Core modules

Human cell and developmental biology 214 (ANA 214)

Module credits 12.00

Service modules Faculty of Natural and Agricultural Sciences

Prerequisites ANA121 and ANA126 and CMY127

Contact time 1 practical per week, 2 lectures per week

Language of tuition Module is presented in English

Academic organisation Anatomy

Period of presentation Semester 1

Module content

Functional review of the cell and cell content. Normal and abnormal cell function in relation to structure. Control of the human cell, heredity and the human genome. Cell communication, growth and development, adhesion and division. Aspects of cellular research. Techniques on how to study cells. Medical cell and molecular biology application. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students.

Paleoanthropology 215 (ANA 215)

Module credits 12.00

Service modules Faculty of Natural and Agricultural Sciences

Prerequisites No prerequisites.

Contact time 2 lectures per week, 1 practical per week
### Language of tuition
Module is presented in English

### Academic organisation
Anatomy

### Period of presentation
Semester 1

### Module content
Introduction to paleoanthropology, focusing on hominin fossil record, principles of evolution, principles of heredity, human variation, introduction to primatology, hominin taxonomy, time-frames and dating methods, fossilisation and taphonomy, trends in hominin evolution, hominin sites. Australopithecus, homo habilis, homo erectus, homo sapiens neanderthalensis, the origin of anatomically modern human beings, DNA studies, palaeo-environments, hominin diets, introduction to the development of culture, South African populations, human adaptation and modernisation.

### Human histology 226 (ANA 226)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>12.00</th>
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</thead>
<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>ANA 126</td>
</tr>
<tr>
<td>Contact time</td>
<td>1 practical per week, 2 lectures per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Anatomy</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
</tr>
</tbody>
</table>

### Module content
General introduction to organ structure.
Terminology. The eye, ear, skin, circulatory system, nervous system, lymphoid system, gastrointestinal tract, gastrointestinal tract glands, respiratory system, urinary system, male and female reproductive systems, endocrine system.
NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students.

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

<table>
<thead>
<tr>
<th>Module credits</th>
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</thead>
<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Health Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>[CMY117 GS] and [CMY127 GS] and [MLB111 GS]</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 90 minute practical per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Afrikaans and English is used in one class</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Biochemistry</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 1</td>
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</tbody>
</table>
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 Afrikaans and English is used in one class
Academic organisation Biochemistry
Period of presentation Semester 1
Module content

Lipid and nitrogen metabolism 261 (BCM 261)
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 Afrikaans and English is used in one class
Academic organisation Biochemistry
Period of presentation Semester 2
Module content
### Biochemical principles of nutrition and toxicology 262 (BCM 262)

**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**
Afrikaans and English is used in one class

**Academic organisation**
Biochemistry

**Period of presentation**
Semester 2

**Module content**

### Human anatomy Part 1 247 (ANA 247)

**Module credits**
12.00

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

**Prerequisites**
ANA 121, ANA 122 and CMY 127

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

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

**Academic organisation**
Anatomy

**Period of presentation**
Semester 2

**Module content**
Regional approach to human anatomy. Cadaver dissection of the head, neck as well as neuro-anatomy. Anatomical techniques.

NOTE: This module is not open to all students and may only be taken by BSc (Medical Sciences) students.
### Elective modules

#### Introductory and neurophysiology 211 (FLG 211)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>12.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>CMY 117, CMY 127, MLB 111 and PHY 131</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 1 practical per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Physiology</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 1</td>
</tr>
</tbody>
</table>

**Module content**

Orientation in physiology, homeostasis, cells and tissue, muscle and neurophysiology, cerebrospinal fluid and the special senses.

Practical work: Practical exercises to complement the theory.

#### Circulatory physiology 212 (FLG 212)

<table>
<thead>
<tr>
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<th>12.00</th>
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<tr>
<td>Prerequisites</td>
<td>CMY 117, CMY 127, MLB 111 and PHY 131</td>
</tr>
<tr>
<td>Contact time</td>
<td>1 practical per week, 2 lectures per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Physiology</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 1</td>
</tr>
</tbody>
</table>

**Module content**

Body fluids; haematology; cardiovascular physiology and the lymphatic system. Practical work: Practical exercises to complement the theory.

#### Lung and renal physiology, acid-base balance and temperature 221 (FLG 221)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>12.00</th>
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<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>FLG 211 and FLG 221</td>
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<tr>
<td>Contact time</td>
<td>2 lectures per week, 1 practical per week</td>
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<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Physiology</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
</tr>
</tbody>
</table>
**Module content**
Structure, gas exchange and non-respiratory functions of the lungs; structure, excretory and non-urinary functions of the kidneys, acid-base balance, as well as the skin and body temperature control.
Practical work: Practical exercises to complement the theory.

**Digestion, endocrinology and reproductive systems 222 (FLG 222)**

<table>
<thead>
<tr>
<th>Module credits</th>
<th>12.00</th>
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<tbody>
<tr>
<td><strong>Service modules</strong></td>
<td>Faculty of Natural and Agricultural Sciences</td>
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<tr>
<td><strong>Prerequisites</strong></td>
<td>FLG 211 and FLG 212</td>
</tr>
<tr>
<td><strong>Contact time</strong></td>
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<tr>
<td><strong>Language of tuition</strong></td>
<td>Module is presented in English</td>
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<tr>
<td><strong>Academic organisation</strong></td>
<td>Physiology</td>
</tr>
<tr>
<td><strong>Period of presentation</strong></td>
<td>Semester 2</td>
</tr>
</tbody>
</table>

**Module content**
Nutrition, digestion and metabolism; hormonal control of the body functions and the reproductive systems.
Practical work: Practical exercises to complement the theory.

**Molecular genetics 251 (GTS 251)**

<table>
<thead>
<tr>
<th>Module credits</th>
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<tbody>
<tr>
<td><strong>Service modules</strong></td>
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<td></td>
<td>Faculty of Education</td>
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<tr>
<td><strong>Prerequisites</strong></td>
<td>GTS 161 GS</td>
</tr>
<tr>
<td><strong>Contact time</strong></td>
<td>fortnightly practicals, 2 lectures per week</td>
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<tr>
<td><strong>Language of tuition</strong></td>
<td>Module is presented in English</td>
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<tr>
<td><strong>Academic organisation</strong></td>
<td>Genetics</td>
</tr>
<tr>
<td><strong>Period of presentation</strong></td>
<td>Semester 1</td>
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</table>

**Module content**

**Genetic diversity and evolution 261 (GTS 261)**

<table>
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<th>Module credits</th>
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<tbody>
<tr>
<td><strong>Service modules</strong></td>
<td>Faculty of Engineering, Built Environment and Information Technology</td>
</tr>
<tr>
<td></td>
<td>Faculty of Education</td>
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<tr>
<td><strong>Prerequisites</strong></td>
<td>GTS 251 GS</td>
</tr>
<tr>
<td><strong>Contact time</strong></td>
<td>2 lectures per week, fortnightly practicals</td>
</tr>
<tr>
<td><strong>Language of tuition</strong></td>
<td>Module is presented in English</td>
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</table>
**Academic organisation**  Genetics  

**Period of presentation**  Semester 2  

**Module content**  

**Bacteriology 251 (MBY 251)**  

<table>
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<th>Module credits</th>
<th>12.00</th>
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<tbody>
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<td>Service modules</td>
<td>Faculty of Engineering, Built Environment and Information Technology</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>MBY 161 GS</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 1 practical per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Microbiology and Plant Path</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 1</td>
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</table>

**Module content**  

**Mycology 261 (MBY 261)**  

<table>
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<th>Module credits</th>
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<td>Service modules</td>
<td>Faculty of Engineering, Built Environment and Information Technology</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>MBY 161</td>
</tr>
<tr>
<td>Contact time</td>
<td>1 practical per week, 2 lectures per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Microbiology and Plant Path</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
</tr>
</tbody>
</table>

**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.
Curriculum: Final year

Minimum credits: 144

Minimum credits:
Core = 72
Elective = 72

Additional information:

Elective credits:
FLG option: 72 credits, GTS option: 72 credits, FLG/FAR option: 72 credits

ANA + FLG option: First semester FLG 330 (18) and FLG 327 (18), second semester FLG 331 (18) and FLG 332 (18)

ANA+ GTS option: First semester GTS 351 (18) and GTS 354 (18), second semester GTS 367 (18) and GTS 368 (18).

ANA+ FLG/FAR option: First semester FLG 330 (18) and FAR 381 (18), second semester FLG 331 (18) or FLG 332 (18) and FAR 382 (18)

Core modules

Forensic anthropology 315 (ANA 315)

<table>
<thead>
<tr>
<th>Module credits</th>
<th>18.00</th>
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<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>ANA 122, ANA 215</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 1 practical per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
</tr>
<tr>
<td>Academic organisation</td>
<td>Anatomy</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 1</td>
</tr>
</tbody>
</table>

Module content
Introduction to forensic anthropology, detection of graves, excavation of graves, human vs. animal bone, forensic entomology, osteometry, cranial and post-cranial measurements, non-metric features of the skeleton, age determination, sex determination, race determination, ante-mortem stature, dental analysis, osteopathology, factors of individualisation, measurements of the face, introduction to face mapping and skull-photo superimposition, legal aspects. NOTE: This module is not open to all students and may only be taken by BSc: Medical Sciences students.

Cell and tissue techniques 316 (ANA 316)

<table>
<thead>
<tr>
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<th>18.00</th>
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<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>ANA 226</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 1 practical per week</td>
</tr>
<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
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<tr>
<td>Academic organisation</td>
<td>Anatomy</td>
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<tr>
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</table>

**Module content**


**Human cell and developmental biology 324 (ANA 324)**

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<tr>
<th>Module credits</th>
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<tbody>
<tr>
<td>Service modules</td>
<td>Faculty of Natural and Agricultural Sciences</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>ANA 214, ANA 226</td>
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<tr>
<td>Contact time</td>
<td>1 practical per week, 3 lectures per week</td>
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<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
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<tr>
<td>Academic organisation</td>
<td>Anatomy</td>
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<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
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</table>

**Module content**


**NOTE:** This module is not open to all students and may only be taken by BSc: Medical Sciences students.

**Human anatomy Part 2 347 (ANA 347)**

<table>
<thead>
<tr>
<th>Module credits</th>
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<tbody>
<tr>
<td>Service modules</td>
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</tr>
<tr>
<td>Prerequisites</td>
<td>ANA 247 GS</td>
</tr>
<tr>
<td>Contact time</td>
<td>2 lectures per week, 2 practicals per week</td>
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<tr>
<td>Language of tuition</td>
<td>Module is presented in English</td>
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<td>Academic organisation</td>
<td>Anatomy</td>
</tr>
<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
</tr>
</tbody>
</table>

**Module content**

Regional approach to human anatomy. Cadaver dissection of the head, neck as well as neuro-anatomy. Anatomical techniques.

**NOTE:** This module is not open to all students and may only be taken by BSc: Medical Sciences students.
Elective modules

Pharmacology 381 (FAR 381)
Module credits 18.00
Service modules Faculty of Natural and Agricultural Sciences
Prerequisites FLG 211, FLG 212, FLG 221, FLG 222 GS
Contact time 2 lectures per week
Language of tuition Afrikaans and English is used in one class
Academic organisation Pharmacology
Period of presentation Semester 1
Module content
Introduction, receptors, antagonism, kinetic principles, drugs that impact upon the autonomic and central nervous system, pharmacotherapy of hypertension, angina pectoris, myocardial infarction, heart failure, arrhythmias, and epilepsy. Diuretics, glucocorticosteroids, local anaesthetics, anaesthetic drugs, analgesics, iron and vitamins, oncostatics and immuno suppressants.

Pharmacology 382 (FAR 382)
Module credits 18.00
Service modules Faculty of Natural and Agricultural Sciences
Prerequisites FAR 381, FLG 211, FLG 212, FLG 221, FLG 222 GS
Contact time 2 lectures per week
Language of tuition Afrikaans and English is used in one class
Academic organisation Pharmacology
Period of presentation Semester 2
Module content
Hormones, drugs that act on the histaminergic, serotoninergic, and dopaminergic receptors. Pharmacotherapy of diabetes mellitus, schizophrenia, depression, obesity, anxiety, insomnia, gastro-intestinal diseases. Anticoagulants, antimicrobial drugs.

Higher neurological functions 327 (FLG 327)
Module credits 18.00
Service modules Faculty of Natural and Agricultural Sciences
Prerequisites BCM 251 GS, BCM 252 GS, BCM 261 GS, BCM 262 GS, FLG 221 and FLG 222
Contact time 2 lectures per week, 1 practical per week
Language of tuition Module is presented in English
Academic organisation Physiology
Period of presentation Semester 1
Module content
Overview of higher cognitive functions and the relationship between psyche, brain and immune system. Practical work: Applied practical work.

**Eukaryotic gene control and development 351 (GTS 351)**

**Module credits** 18.00

**Prerequisites** GTS 251 GS and GTS 261 GS

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

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

**Academic organisation** Genetics

**Period of presentation** Semester 1

**Module content**
Regulation of gene expression in eukaryotes: regulation at the genome, transcription, RNA processing and translation levels. DNA elements and protein factors involved in gene control. The role of chromatin structure and epigenetic changes. Technology and experimental approaches used in studying eukaryotic gene control. Applications of the principles of gene control in embryonic development and differentiation, cancer and other diseases in humans.

**Genome evolution and phylogenetics 354 (GTS 354)**

**Module credits** 18.00

**Prerequisites** GTS 251 GS and GTS 261 GS

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

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

**Academic organisation** Genetics

**Period of presentation** Semester 1

**Module content**

**Population and evolutionary genetics 367 (GTS 367)**

**Module credits** 18.00

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

**Prerequisites** GTS 251 and GTS 261

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

**Language of tuition** Module is presented in English
### Academic organisation
Genetics

### Period of presentation
Semester 2

### Module content

### Genetics in human health 368 (GTS 368)

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<tr>
<td>Contact time</td>
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<td>Language of tuition</td>
<td>Module is presented in English</td>
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<td>Academic organisation</td>
<td>Genetics</td>
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<td>Period of presentation</td>
<td>Semester 2</td>
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### Module content

### Applied and pathophysiology 332 (FLG 332)

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<td>Language of tuition</td>
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<td>Physiology</td>
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<tr>
<td>Period of presentation</td>
<td>Semester 2</td>
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</table>

### Module content
Integration of all the human physiological systems. Practical work: Applied practical work.

### Cellular and developmental physiology 330 (FLG 330)

<table>
<thead>
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<th>Module credits</th>
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<tr>
<td><strong>Prerequisites</strong></td>
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<tr>
<td><strong>Contact time</strong></td>
<td>2 lectures per week, 1 practical per week</td>
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<td><strong>Language of tuition</strong></td>
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<td><strong>Academic organisation</strong></td>
<td>Physiology</td>
</tr>
<tr>
<td><strong>Period of presentation</strong></td>
<td>Semester 1</td>
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</tbody>
</table>

**Module content**

During this module the biology of cellular processes such as the cell cycle, cell death, migration and their related cellular signalling pathways will be discussed as well as their role in early stage embryology and age-related pathologies. Practical work: Exposure to applied molecular biology techniques.

The information published here is subject to change and may be amended after the publication of this information. The [General Regulations (G Regulations)](https://www.up.ac.za) 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](https://www.up.ac.za) section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.