



BSc Medical Sciences

- [University of Pretoria](#)
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- BSc Medical Sciences

Faculty of Natural and Agricultural Sciences
Department: Anatomy

Programme Code: 02133407

SAQA ID: 14904

The Department of Anatomy forms part of the School of Medicine in the Faculty of Health Sciences and it offers a BSc degree in Medical Sciences in the Faculty of Natural and Agricultural Sciences. Students are trained in the basic medical sciences, which include clinical anatomy, physical and forensic anthropology, histology, cell biology and embryology. These subjects can be combined with elective modules from physiology, pharmacology and genetics. Ideally, students who register for this degree should have a keen interest in research related to anatomy and the basic medical sciences.

Students are trained in the basic medical sciences, including clinical anatomy, physical anthropology and cell biology. During the course of their studies they work with human material, including human skeletal material, and do cadaver dissection.

Career opportunities exist in the field of research in any of the subdisciplines of anatomy, in academia, in forensic science and in the health science industry. Other careers that may be considered are in sports science, virology, chemical pathology, immunology, health administration or ergonomics. Technical careers, for example in the Departments of Anatomy or Physiology at universities, are another possibility.

Graduates are sought after by institutes in the academic, government and private sectors, where they are employed as lecturers, researchers, medical and forensic scientists, and sales representatives in the medical sciences and pharmacological industries. Several of our postgraduates are currently studying at research facilities in North America and Europe.

For more information, please consult the Faculty webpage.



Career Opportunities

Postgraduate studies are highly recommended. Honours, master's and doctoral degrees can be obtained in any of the subdisciplines of anatomy: neuro-anatomy, clinical anatomy, cell biology, physical and forensic anthropology, histology and embryology. Students who obtain this degree can also continue with their studies to obtain postgraduate degrees in physiology, genetics and pharmacology. Career opportunities include research in any of the subdisciplines of anatomy, in academia, in forensic science and in the health science industry. Other careers that can be considered are in the sport sciences, virology, chemical pathology, immunology, health administration or ergonomics. Technical careers are also possible, for example in the Anatomy or Physiology departments at universities.

Faculty Notes

All modules will only be presented in English, as English is the language of tuition, communication and correspondence at the University of Pretoria.

Faculty Yearbooks: [click here](#).

The University of Pretoria has decided not to set a specific closing date for applications to non-selection programmes for 2023. Applications will close when the available study spaces are filled (**close on availability of space**). Once the available number of study places for a specific programme are filled, no further applications for that particular programme will be considered. All applicants are therefore strongly advised and encouraged to submit their applications as soon as possible after 1 April 2022 and to check the application site (UP Student Portal) regularly.

The Faculty of Natural and Agricultural Sciences is home to more than 6 500 undergraduate and postgraduate students. The Faculty presents degrees in fields ranging from the proverbial A to Z - from actuaries to zoologists, and consists of 13 departments.

All degree programmes are designed to develop problem-solving individuals who can easily adapt to changing circumstances and take the lead in their chosen fields of specialisation. The qualifications awarded are of world-class and provide access to a multitude of career opportunities for dynamic and creative people. According to the latest Times Higher Education World University Rankings the University has achieved new world rankings in Physical Sciences, a discipline which features strongly in NAS and also maintains excellent positions on the ISI Web of Science (WOS) field rankings in Plant and Animal Sciences, Agricultural Sciences, and Environment and Ecology Sciences.

In the Faculty of Natural and Agricultural Sciences, we strive to continuously improve our high impact



research and significantly address the national shortage of PhD graduates that respond to global and local challenges.

- **Disclaimer:** *This publication contains information about regulations and programmes of the University of Pretoria. Amendments to or updating of the information may be effected from time to time without prior notification. The accuracy, correctness or validity of the information contained here is therefore not guaranteed by the University at any given time and is always subject to verification. The user is kindly requested to verify the correctness of the information with the University at all times. Failure to do so will not give rise to any claim or action of any nature against the University by any party whatsoever.*
- [Programme information](#)
- [Curriculum](#)
- [Tuition Fees](#)

Selection Process

Only 72 places are available in the first year of BSc (Medical Sciences). Students who apply for BSc (Medical Sciences) as their first choice before 30 September, and who meet the minimum entrance requirements, will be admitted until the places are full.

Minimum duration of study

3 years, full-time

Total credits

432

Admission Requirements

Important information for all prospective students for 2023

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.

Minimum requirements

Achievement level

English Home

Language or

English First

Additional

Language

NSC/IEB

5

Mathematics

NSC/IEB

5

Physical Sciences

NSC/IEB

5

APS

32

Limited places are available in the first year of BSc (Medical Sciences). Students who apply for BSc (Medical Sciences) as their first choice, and who meet the minimum admission requirements, will be admitted until the places have been filled. Transfers from the extended programme are allowed after three semesters in the extended programme only if students comply with all of the prerequisites for ANA 121, ANA 122 and ANA 126 (CMY 117 and MLB 111, or their equivalent, passed).

Life Orientation is excluded when calculating the APS.

You will be considered for final admission to degree studies if space allows, and if you have a National Senior Certificate (NSC) or equivalent qualification with admission to bachelor's degree studies, and comply with the minimum subject requirements as well as the APS requirements of your chosen programme.

Applicants with qualifications other than the abovementioned should refer to the Brochure: Undergraduate Programme Information 2023: Qualifications other than the NSC and IEB, available at [click here](#).

International students: [Click here](#).

Transferring students

A transferring student is a student who, at the time of applying at the University of Pretoria (UP) is/was a registered student at another tertiary institution. A transferring student will be considered for admission based on NSC or equivalent qualification and previous academic performance. Students who have been dismissed from other institutions due to poor academic performance will not be considered for admission to UP.

Closing dates: Same as above.

Returning students

A returning student is a student who, at the time of application for a degree programme is/was a



registered student at UP, and wants to transfer to another degree at UP. A returning student will be considered for admission based on NSC or equivalent qualification and previous academic performance.

Note:

- Students who have been excluded/dismissed from a faculty due to poor academic performance may be considered for admission to another programme at UP, as per faculty-specific requirements.
- Only ONE transfer between UP faculties and TWO transfers within a faculty will be allowed.
- Admission of returning students will always depend on the faculty concerned and the availability of space in the programmes for which they apply.

Closing date for applications from returning students

Unless capacity allows for an extension of the closing date, applications from returning students must be submitted before the end of August via your UP Student Centre.

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

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

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Note:

*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 upgrading or taking a gap year will not be considered.



Other programme-specific information

1.1 Requirements for specific modules

A candidate who:

- a. does not qualify for STK 110, must enrol for STK 113 and STK 123;
- b. 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, STC 122, STK 210, STK 220, WST 212, STK 310, STK 320, STK 353.
- c. 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

- a. 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.
- b. 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

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 relevant 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 relevant 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 Senate Appeals Committee.
- Any decision taken by the Senate Appeals Committee is final.

General 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.

Minimum credits: 144

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 367 (18), second semester GTS 354 (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

[ANA 315 Forensic anthropology 315 Credits: 18.00](#) 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.

Prerequisites ANA 122, ANA 215; Only for BSc (Medical Sciences) students.

Period of presentation Semester 1

[ANA 316 Cell and tissue techniques 316 Credits: 18.00](#) Module content:

General introduction to light and electron microscopic techniques: fixation, processing, imbedding, staining. Principles of different staining techniques for LM and EM: routine stains, proteins, carbohydrates, amino acids, metachromasia, immunocytochemistry, lectin stains, specialised stains. Principles of the operation of LM and EM: general LM, fluorescent microscopy, differential contrast microscopy, dark field microscopy, phase contrast microscopy, transmission and scanning electron microscopy. NOTE: This module is not open to all students and may only be taken by BSc (Medical Sciences) students.

Prerequisites ANA 226; Only for BSc (Medical Sciences) students.

Period of presentation Semester 1

[ANA 324 Human cell and developmental biology 324 Credits: 18.00](#) Module content:

Practical aspects of cell biology. Cell, tissue, organ, and organism culture. The biology of the culture environment. Cellular basis of morphogenesis, cleavage patterns and gastrulation. The early vertebrate development; neurulation, ecto-, meso- and endoderm derivatives. Cell destiny and embryonic axis including malformations. Development of the tetrapod limb and cell death. Cell interactions at a distance through hormones and metamorphosis.

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



Prerequisites ANA 214, ANA 226; Only for BSc (Medical Sciences) students.

Period of presentation Semester 2

[ANA 347 Human anatomy Part 2 347 Credits: 18.00](#) 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.

Prerequisites ANA 247; Only for BSc (Medical Sciences) students.

Period of presentation Semester 2

Elective modules

[FAR 381 Pharmacology 381 Credits: 18.00](#) Module content:

The undergraduate pharmacology module introduces students to general pharmacological principles, routes of administration, pharmacokinetics and pharmacodynamics. Furthermore, disease treatment with relation to disorders of the cardiovascular, inflammatory and autonomic nervous system is discussed, as well as anaesthesia, asthma, diabetes, diuresis, obesity and pain.

Prerequisites FLG 211, FLG 212, FLG 221, FLG 222 GS

Period of presentation Semester 1

[FAR 382 Pharmacology 382 Credits: 18.00](#) Module content:

Hormones, drugs that act on the histaminergic, serotonergic, and dopaminergic receptors.

Pharmacotherapy of diabetes mellitus, schizophrenia, depression, obesity, anxiety, insomnia, gastrointestinal diseases. Anticoagulants, antimicrobial drugs.

Prerequisites FAR 381, FLG 211, FLG 212, FLG 221, FLG 222 GS

Period of presentation Semester 2

[FLG 327 Higher neurological functions 327 Credits: 18.00](#) Module content:

Overview of higher cognitive functions and the relations between psyche, brain and the immune system. Practical work: Applied practical work with specific examples drawn from South African case studies taught within the framework of the UN Sustainable Development Goal 3 (Good Health and Well-being).

Prerequisites BCM 251 GS, BCM 252 GS, BCM 257 GS, FLG 221 GS and FLG 222 GS

Period of presentation Semester 1

[FLG 330 Cellular and developmental physiology 330 Credits: 18.00](#) 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 with specific examples drawn from South African case studies taught within the framework of the UN Sustainable Development Goal of Good Health and Well-being (Sustainable Development Goal 3).

Prerequisites BCM 251 GS, BCM 252 GS, BCM 257 GS, FLG 221 GS and FLG 222 GS

Period of presentation Semester 1

[FLG 331 Exercise and nutrition science 331](#) Credits: 18.00 Module content:

Mechanisms of muscle contraction and energy sources. Cardio-respiratory changes, thermo-regulation and other adjustments during exercise. Use and misuse of substances to improve performance. Practical work: Applied practical work with exercise descriptions for the South African context taught within the framework of the UN Sustainable Development Goal 3 (Good Health and Well-being).

Prerequisites BCM 251 GS, BCM 252 GS, BCM 257 GS, FLG 221 GS and FLG 222 GS

Period of presentation Semester 2

[FLG 332 Applied and pathophysiology 332](#) Credits: 18.00 Module content:

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

Prerequisites BCM 251 GS, BCM 252 GS, BCM 257 GS, FLG 221 GS and FLG 222 GS

Period of presentation Semester 2

[GTS 351 Eukaryotic gene control and development 351](#) Credits: 18.00 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 eg cell signaling pathways, development cancer and other diseases in humans.

Prerequisites GTS 251 GS and GTS 261 GS

Period of presentation Semester 1

[GTS 354 Genome evolution and phylogenetics 354](#) Credits: 18.00 Module content:

A unifying framework for biology. Mechanisms involved in the evolution of genes, genomes and species. Comparative genomics across the kingdoms of life. Phylogenetic inference. Applications of phylogenetics and evolutionary genomics research, including relevance to sustainable development goals for food security, good health and the biosphere.

Prerequisites GTS 251 and GTS 261 GS

Period of presentation Semester 2



[GTS 367 Population and evolutionary genetics 367](#) Credits: 18.00 Module content:

Processes that affect genetic evolution: mutation, drift, natural selection and recombination. Fisher-Wright and coalescence models. Groupings of genes: linkage, inbreeding, population structure and gene flow. Neutral and nearly neutral theory. Quantitative genetics and the phenotype. Optimality. Adaptation. Levels of selection in sex ratios and conflict. Reproductive value and life history. Relatedness and kin selection. Sexual reproduction and selection. Genomic complexity and neutrality.

Prerequisites GTS 251 GS and GTS 261 GS.

Period of presentation Semester 1

[GTS 368 Genetics in human health 368](#) Credits: 18.00 Module content:

Application of modern genetics to human variability, health and disease. Molecular origin of Mendelian and multifactorial diseases. The use of polymorphisms, gene mapping, linkage and association studies in medical genetics. Genetic diagnosis: application of cytogenetic, molecular and genomic techniques. Congenital abnormalities, risk assessment and genetic consultation. Prenatal testing, population screening, treatment of genetic diseases and gene-based therapy. Pharmacogenetics and cancer genetics. Ethical aspects in medical genetics.

Prerequisites GTS 251 and GTS 261 GS

Period of presentation Semester 2

Annual increase information:

- Module pricing is subject to change at the beginning of every year without prior notice.
- UP Online tuition fees will increase annually by approximately 5%.
- The annual increase will apply from the March intake, which is the second intake of the year.
- If the programme fee is paid in full upfront the student is still liable for the difference between the upfront payment and increased amount until the completion of the programme.
- If you have any historic debt owed to the University of Pretoria, any payment you make will go towards settling that debt first.
- All-inclusive total programme cost.

- SA/SADC
- International

Code	Module	Duration	Credits	Cost
Core modules				
ANA 315	Forensic anthropology 315		18.00	TBA
ANA 316	Cell and tissue techniques 316		18.00	TBA
ANA 324	Human cell and developmental biology 324		18.00	TBA



Code	Module	Duration	Credits	Cost
ANA 347	Human anatomy Part 2 347		18.00	TBA
Elective modules				
FAR 381	Pharmacology 381		18.00	TBA
FAR 382	Pharmacology 382		18.00	TBA
FLG 327	Higher neurological functions 327		18.00	TBA
FLG 330	Cellular and developmental physiology 330		18.00	TBA
FLG 331	Exercise and nutrition science 331		18.00	TBA
FLG 332	Applied and pathophysiology 332		18.00	TBA
GTS 351	Eukaryotic gene control and development 351		18.00	TBA
GTS 354	Genome evolution and phylogenetics 354		18.00	TBA
GTS 367	Population and evolutionary genetics 367		18.00	TBA
GTS 368	Genetics in human health 368		18.00	TBA
Totals			252.00	TBA

Enquiries about the programme

[Click Here](#)



How to apply



Online Application





Note: Also consult General Rules and Information on the Yearbook website for additional information.

Disclaimer: Due to the continuous restructuring of the Faculty and this website, some of the information displayed here may not fully reflect the most recent developments in the Faculty. Any discrepancies that are experienced may be taken up with Student Administration of the Faculty.