



University of Pretoria Yearbook 2023

BScHons (Bioinformatics) (02240702)

Department Genetics

Minimum duration of study 1 year

Total credits 135

NQF level 08

Admission requirements

1. Relevant BSc degree
2. A weighted average of at least 60% at final-year level

Note: Additional modules may be required in order to reach the desired level of competency

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 (HEQF) 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.



Curriculum: Final year

Minimum credits: 135

Core credits: 120

Elective credit: 15

Additional information:

Students with degrees in biological sciences should choose BME 780 as an elective. Students from computer science and other related backgrounds should choose BIF 704. Other additional modules may be prescribed for non-degree purposes to address shortcomings in a candidate's undergraduate training.

Core modules

Bioinformatics theory and applications 701 (BIF 701)

| | |
|-------------------------------|--|
| Module credits | 30.00 |
| NQF Level | 08 |
| Prerequisites | No prerequisites. |
| Contact time | 2 lectures per week, 2 practicals per week |
| Language of tuition | Module is presented in English |
| Department | Biochemistry, Genetics and Microbiology |
| Period of presentation | Year |

Module content

General concepts in bioinformatics; sequence motifs and features; sequence databases; common bioinformatics tools; programming in Python; the bioinformatics toolkit for Python; pairwise and multiple sequence alignments; genome analysis; data visualisation; specialised statistics for bioinformatics; specialised algorithms for bioinformatics; nucleic acid modelling; transcription analysis; microarray data analysis; genome annotation; phylogenetics; mapping and markers; structural modelling.

Trends in bioinformatics and literature seminar 702 (BIF 702)

| | |
|-------------------------------|---|
| Module credits | 15.00 |
| NQF Level | 08 |
| Prerequisites | No prerequisites. |
| Contact time | 1 lecture per week |
| Language of tuition | Module is presented in English |
| Department | Biochemistry, Genetics and Microbiology |
| Period of presentation | Year |

Module content

Study and discussion of topical research results from recent scientific publications.



Research project and report 703 (BIF 703)

| | |
|-------------------------------|---|
| Module credits | 60.00 |
| NQF Level | 08 |
| Prerequisites | No prerequisites. |
| Contact time | 1 other contact session per week |
| Language of tuition | Module is presented in English |
| Department | Biochemistry, Genetics and Microbiology |
| Period of presentation | Year |

Molecular and cellular biology 721 (MLB 721)

| | |
|-------------------------------|---|
| Module credits | 15.00 |
| NQF Level | 08 |
| Prerequisites | No prerequisites. |
| Contact time | 2 discussion classes per week |
| Language of tuition | Module is presented in English |
| Department | Biochemistry, Genetics and Microbiology |
| Period of presentation | Year |

Module content

Principles and applications of recombinant DNA, and other novel molecular and genomics technologies, to address questions in the biological sciences and/or biotechnology. Strong emphasis is placed on the principles of research planning, including identifying suitable research objectives, formulating a research strategy and understanding the relevance and feasibility of research. The module is assessed by means of a research project proposal, conceived and formulated by each student. The proposal must focus on the use of molecular technologies in addressing realistic questions in biology and/or biotechnology. There is also an oral defense of the project proposal.

This module is jointly presented in the Departments of Biochemistry, Genetics and Microbiology and Plant and Soil Sciences.

Elective modules

Introduction to molecular biology for bioinformatics 704 (BIF 704)

| | |
|-------------------------------|---|
| Module credits | 15.00 |
| NQF Level | 08 |
| Prerequisites | No prerequisites. |
| Contact time | 1 lecture per week |
| Language of tuition | Module is presented in English |
| Department | Biochemistry, Genetics and Microbiology |
| Period of presentation | Year |



Module content

Atoms and molecules; the chemistry of life, organisation of the cell; energy; chromosomes; heredity; DNA; RNA and protein synthesis; gene regulation; genetic engineering; genomes; genes and development; evolution; speciation; diversity.

Statistics for biological sciences 780 (BME 780)

| | |
|-------------------------------|--|
| Module credits | 15.00 |
| NQF Level | 08 |
| Service modules | Faculty of Natural and Agricultural Sciences |
| Prerequisites | No prerequisites. |
| Contact time | 2 Block weeks |
| Language of tuition | Module is presented in English |
| Department | Statistics |
| Period of presentation | Semester 1 |

Module content

The principles of experimental design as required for the selection of an appropriate research design. Identification of the design limitations and the impact thereof on the research hypotheses and the statistical methods. Identification and application of the appropriate statistical methods needed. Interpreting of statistical results and translating these results to the biological context.

Regulations and rules

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

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.

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