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# University of Pretoria Yearbook 2017

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## BScHons Bioinformatics (02240702)

**Duration of study** 1 year

**Total credits** 135

### Programme information

#### Renewal of registration

- i. Subject to exceptions approved by the Dean, on the recommendation of the head of department, and in the case of distance education where the Dean formulates the stipulations that will apply, a student may not sit for an examination for the honours degree more than twice in the same module.
- ii. A student for an honours degree must complete his or her study, in the case of full-time students, within two years and, in the case of after-hours students, within three years of first registering for the degree and, in the case of distance education students, within the period stipulated by the Dean. Under special circumstances, the Dean, on the recommendation of the head of department, may give approval for a limited extension of this period.

In calculating marks, General Regulation G.12.2 applies.

Apart from the prescribed coursework, a research project is an integral part of the study.

### Admission requirements

Students must be in possession of a bachelor's degree in bioinformatics, biological sciences, computer science, informatics, mathematics, mathematical statistics or computer engineering. Students with a bachelor's degree in either physics, mathematics, mathematical statistics or electronic engineering may be required to do a special postgraduate bridging year before admission to BScHons in Bioinformatics. Admission is additionally dependent on availability of supervisor/s and/or projects within the department.

### Pass with distinction

The BScHons degree is awarded with distinction to a candidate who obtains a weighted average of at least 75% in all the prescribed modules and a minimum of 65% in any one module.



## Curriculum: Final year

### Minimum credits: 135

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Core credits: 120

Elective credit: 15

### Other programme-specific 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

**Prerequisites** No prerequisites.

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

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

**Academic organisation** Biochemistry

**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

**Prerequisites** No prerequisites.

**Contact time** 1 lecture per week

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

**Academic organisation** Biochemistry

**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



<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 other contact session per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Biochemistry
<b>Period of presentation</b>	Year

### **Molecular and cellular biology 721 (MLB 721)**

<b>Module credits</b>	15.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 discussion classes per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Microbiology and Plant Path
<b>Period of presentation</b>	Semester 2

#### **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 Pathology.

## **Elective modules**

### **Introduction to molecular biology for bioinformatics 704 (BIF 704)**

<b>Module credits</b>	15.00
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	1 lecture per week
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Biochemistry
<b>Period of presentation</b>	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.



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## Statistics for biological sciences 780 (BME 780)

<b>Module credits</b>	15.00
<b>Service modules</b>	Faculty of Natural and Agricultural Sciences
<b>Prerequisites</b>	No prerequisites.
<b>Contact time</b>	2 Block weeks
<b>Language of tuition</b>	Module is presented in English
<b>Academic organisation</b>	Statistics
<b>Period of presentation</b>	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.

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The information published here is subject to change and may be amended after the publication of this information. The [General Regulations \(G Regulations\)](#) apply to all faculties of the University of Pretoria. It is expected of students to familiarise themselves well with these regulations as well as with the information contained in the [General Rules](#) section. Ignorance concerning these regulations and rules will not be accepted as an excuse for any transgression.