

University of Pretoria Yearbook 2021

BScHons Biotechnology (02240393)

Department Genetics

Minimum duration of study 1 year

Total credits 135

NQF level 08

Programme information

BScHons (Biotechnology) is a unique interdepartmental programme aimed at enabling students to pursue their interest in molecular biotechnology through relevant research areas offered within fields of biochemistry, plant science, microbiology and plant pathology, plant production, as well as genetics. Students within this programme will be registered and will conduct their studies within the department of their choice. A student's choice of research programme will determine which of the respective departments will mentor their honours degree programme.

Renewal of registration

- i. Subject to exceptions approved by the Dean, on the recommendation of the relevant head of department, 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. Under special circumstances, the Dean, on the recommendation of the relevant 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

1. Relevant BSc degree
2. Eukaryotic Gene Control and Development, Macromolecules of Life: Structure-Function and Bioinformatics and Genetic Manipulation of Microbes (or equivalent) passed at final-year level
3. A weighted average of at least 60% at final-year level
4. An admission examination may be required

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

Core credits: 35

Elective credits: 100

Additional information:

- Students registered in the Division of Biochemistry must take BCM 771, BCM 773 and BCM 774 as electives.
- Students registered in the Division of Genetics must take GTK 702, GTK 703 and GTK 705 as electives.
- Students registered in the Division of Microbiology must take MCP 751, MCP 752 and MCP 754 as electives.
- Students registered in the Department of Plant and Soil Sciences must take BOT 705, BOT 746, BOT 782 and BOT 783 as electives.

Core modules

Biotechnology in the workplace 701 (BTW 701)

Module credits	20.00
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

Introduction to the principles and realities of working in the field of biotechnology. Discussions on various essential components of the biotechnology industry including bio-entrepreneurship, marketing, business plan writing, business communication skills, capital for start-ups, incubators, basic accounting and finance as well as issues surrounding biosafety, ethics and legal aspects. The module is concluded by students writing a business plan for the development of a hypothetical biotechnological venture. This module is jointly presented in the Departments of Biochemistry, Genetics and Microbiology and Plant and Soil Sciences.

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

Scientific communication 771 (BCM 771)

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

Module content

Students are guided to collect relevant and up-to-date literature on broad topics from databases using referencing software, and to select and condense relevant papers into the outline for a literature review. Critical reading of research papers, article discussions and presentations. Scientific writing and presentation skills.

Research project and report 773 (BCM 773)

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

Research methods 774 (BCM 774)

Module credits	25.00
NQF Level	08
Prerequisites	No prerequisites.

Contact time	2 Practicals/Discussion classes per week
Language of tuition	Module is presented in English
Department	Biochemistry, Genetics and Microbiology
Period of presentation	Year

Module content

Students are guided through the methodology of research planning and data handling. They are given hands-on and in-depth practical experience in a range of biochemical and molecular biological techniques.

Molecular techniques 705 (BOT 705)

Module credits	15.00
NQF Level	08
Prerequisites	Admission into BSc Hons in Plant Science (Plant Biotechnology/Physiology)
Contact time	1 discussion class per week, 1 lecture per week, 5 practical per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Students are guided through the methodology of research planning and data handling. They are offered hands-on experience in a range of advanced techniques employed in molecular research and analysis.

Applications in plant biotechnology 746 (BOT 746)

Module credits	10.00
NQF Level	08
Prerequisites	No prerequisites.
Contact time	1 lecture per week, 1 practical per week
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 2

Module content

Plant tissue culture. Plant gene transfer technologies (Agrobacterium-based, biolistics and other). Design of plant gene transfer constructs, including synthetic biology. New plant breeding technologies, including plant gene editing. Applications of genetically modified (GM) and gene edited crops and their impact on modern agriculture. Biosafety evaluation and regulation of GM and new plant breeding technologies.

Research report 782 (BOT 782)

Module credits	60.00
NQF Level	08

Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Teaching and planning, execution and documentation of a research project.

Seminar 783 (BOT 783)

Module credits	15.00
NQF Level	08
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Department of Plant and Soil Sciences
Period of presentation	Semester 1

Module content

Literature study, discussion and oral presentation of a subject related to the main discipline.

Scientific communication 702 (GTK 702)

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

Module content

Students are guided to collect relevant and up-to-date literature on large topics from databases using referencing software, and to select and condense relevant papers into the outline for a literature review. Critical reading of research papers, article discussions and presentations. Scientific writing skills.

Research project 703 (GTK 703)

Module credits	60.00
NQF Level	08
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Biochemistry, Genetics and Microbiology

Period of presentation Year

Module content

A mini-dissertation with well-defined limits is undertaken under the guidance of a supervisor. The students are allowed to choose from a number of projects from the different research programmes in the department. The module also has a strong theoretical component since emphasis is placed on writing and presenting a comprehensive literature review and project proposal. Additional technical and analytical training is provided. The project is concluded with a final report, presented in the format of a short manuscript, as well as a poster and an oral presentation.

Research methods 705 (GTK 705)

Module credits 25.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 2 Practicals/Discussion classes per week

Language of tuition Module is presented in English

Department Biochemistry, Genetics and Microbiology

Period of presentation Year

Module content

Students are guided through the methodology of research planning and data handling. They are offered hands-on experience in a range of advanced techniques employed in molecular research and analysis.

Research methods 751 (MCP 751)

Module credits 25.00

NQF Level 08

Prerequisites No prerequisites.

Contact time 2 Practicals/Discussion classes per week

Language of tuition Module is presented in English

Department Biochemistry, Genetics and Microbiology

Period of presentation Year

Module content

The module provides students with planning, data handling, writing, and presentation skills required for microbiological research. In addition, students are provided with hands-on experience in the advanced techniques utilised in research and analysis.

Scientific communication 752 (MCP 752)

Module credits 15.00

NQF Level 08

Prerequisites	No prerequisites.
Contact time	1 discussion class per week, 1 seminar per week
Language of tuition	Module is presented in English
Department	Biochemistry, Genetics and Microbiology
Period of presentation	Year

Module content

Students are guided to collect relevant literature from disparate papers in the broader field of Microbiology and to condense and collate this into a written seminar, which is also presented verbally.

Research project and literature study 754 (MCP 754)

Module credits	60.00
NQF Level	08
Prerequisites	No prerequisites.
Language of tuition	Module is presented in English
Department	Biochemistry, Genetics and Microbiology
Period of presentation	Year

Module content

The module includes both practical and theoretical components. In addition to an individual research project with well-defined limits that is undertaken under the guidance of a lecturer, the module also acquaint the student with the theoretical aspects relevant to a specific research topic. The research project is thus preceded by the presentation of an in-depth review of the relevant literature, and the project is concluded with a progress report, presented in the format of a short publication and an oral presentation.

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.